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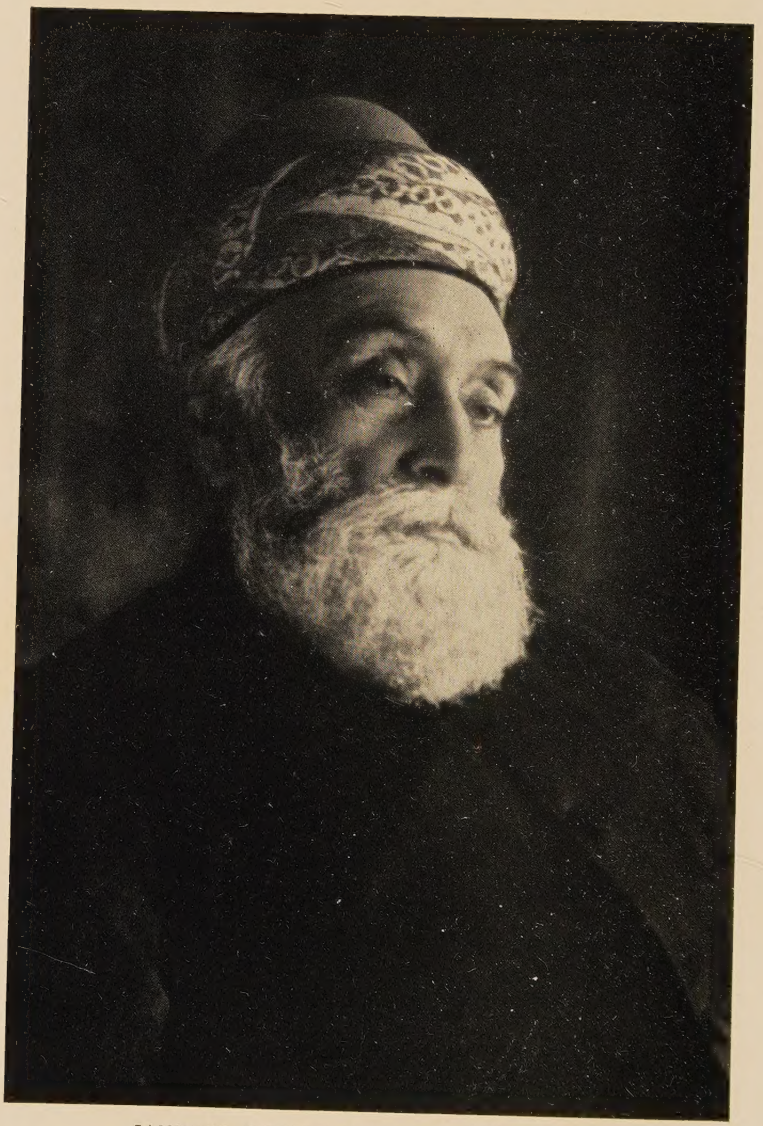

JAMSETJI NUSSERWANJI TATA (1839-1904)

frontispiece

F. R. HARRIS

JAMSETJI NUSSERWANJI TATA

A chronicle of his life

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WITH A FOREWORD
BY J. R. D. TATA

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FOREWORD

BY J. R. D. TATA

JAMSETJI TATA died over half a century ago. Few people remain today who had personal contact with him or remember meeting or seeing him. His sons and lieutenants, his political and business associates, his staff and his workers have passed from the scene. It is probably true to say that to most of the present generation, outside those who work within the House of Tata, he is primarily known as a wealthy industrial pioneer and philanthropist of the last century who gave his name to a group of industrial concerns and endowment trusts. Yet few men have played so vital a part in the renaissance of India and there is much to be learned even today from the life and work of this remarkable man.

Harris's Life of J. N. Tata which appeared in 1925, 21 years after his death, was and still is the only reasonably full and connected story of his life. That edition has long been exhausted. Blackie's new edition comes at the right time when the country has embarked on a great programme of industrial development, for it was Tata who laid the foundations of modern Indian industry, without which the present programme would be difficult of achievement or have been long delayed. Amidst the present welter of conflicting ideas and philosophies in the economic and industrial field, many of them half baked and half digested, we could do with some of the clear thinking, the courage and reliance on basic truths and values which the reader will find in abundance in the Life of J. N. Tata. I am happy therefore at this renewed opportunity to study his life and work.

Much has happened since Jamsetji Tata died. Here in India, as elsewhere, the extent and character of the changes have no parallel in previous history. Even more remarkable has been the rate of change. Between Jamsetji's

death in 1904 and the publication of Harris's book in 1925, the changes, marked as they were, appear inconsiderable in the light of subsequent developments in the political, industrial and economic life of the country. If we are to view Jamsetji's life-work and ideas in their proper perspective, we should do so in the light of these subsequent changes and against the background of the conditions which prevailed at the time in which he lived.

Jamsetji was born and lived the earlier part of his life during one of the darkest periods in the long and chequered history of India. He was eighteen at the time of the abortive revolt against foreign rule which took place just a hundred years ago. As he began his career, the grip of colonial rule and exploitation reached its peak. Independent thought or action in any field other than the literary, spiritual or religious was frowned upon. The people of India, their spirit broken, stagnated politically, socially and economically, and the élite sought solace in religious meditation or sterile contemplation of the country's past glories.

Then came on the scene a succession of remarkable men. Beginning with Dadabhai Naoroji and ending with Jawaharlal Nehru, happily still with us, men like Pherozeshah Mehta, Tilak, Tagore, Motilal Nehru, Gokhale, C. R. Das, Vallabhbhai Patel and above all Mahatma Gandhi, lighted the darkness, reawakened the political and social consciousness of the people and in a unique struggle, peaceful and constructive, the like of which has never been seen before, won back the people's self respect and finally their independence. J. N. Tata has an honoured place amongst these giants for, as we look back upon his life, it is clear that the part he played in his own field was as important to India's rebirth as that of the others.

Indian industry did not begin with Jamsetji Tata. In fact no date or period can be laid down for such a beginning. India was, for thousands of years, a highly industrialized country in the sense that it produced with great skill and in large quantities goods and products which not only met its own requirements but were

exported to half the world, from Europe to China. Electricity, railways, and the telegraph came to India in the nineteenth century, pretty well at the same time as they were introduced in the countries of their origin. The power-driven cotton textile industry, in which Jamsetji Tata played such a prominent role, was itself established well before J. N. Tata entered the field. The genius of Jamsetji, however, and the essence of his contribution to the later growth of Indian industry is that he alone in his time understood the full significance of the industrial revolution in the West and of its potentialities for his own country. Where others thought primarily or exclusively in terms of political action, he saw clearly that India's freedom could not be achieved or maintained by political means alone, that freedom without the strength to support and, if need be, defend it, would be a cruel delusion and that the strength to defend freedom could itself only come from widespread industrialization and the infusion of modern science and technology into the country's economic life.

It is a measure of the man that despite the changes which have since taken place, his ideas and industrial philosophy remain today as fresh and vital as they were in his time. Jamsetji Tata dreamt of an industrialized and prosperous India. Under conditions which would have appalled and discouraged lesser men, he set about to breathe life into his dream. He realized that if he was to achieve anything worthwhile in his life time, he must not fritter away his resources by attempting to do too much over too wide a range of activities. He wisely concentrated his energies, knowledge and wealth on three schemes which would not only be within his own resources to bring to life but which, he saw, were essential to any future progress and, once established, would set the pattern and the pace for future development. The three basic ingredients of economic progress, as he saw them, were steel, electric power and technical education combined with research. The soundness of his reasoning may seem pretty obvious to us today, but under the conditions prevailing in India some seventy years ago when

all progress, other than that geared to satisfying colonial needs, was firmly discouraged or ridiculed, it required an exceptionally lucid and well-furnished mind, backed by courage and determination, to see the basic issues so clearly and to plan in detail the programme of action which he adopted.

He died before the Steel Works at Jamshedpur, the Hydro-Electric Power Plants near Bombay and the Institute of Science at Bangalore were established, but, fortunately, the enthusiasm and devotion which he inspired amongst his sons and lieutenants and their faith in his ideas were so great that his plans for the three great projects were pursued with unabated vigour and determination after his death and, in due course, brought into being. They were, in fact, rapidly followed by many new ventures in the fields of engineering, chemicals, civil aviation and insurance among others, all, with rare exceptions, inspired by the same driving purpose of promoting and accelerating the industrial development of the country.* It is impossible, within the compass of a brief foreword, to attempt to assess with any precision the effect which the creation of these key industries and the Indian Institute of Science at Bangalore had on subsequent events in the country. There can be no doubt, however, that they did in fact largely achieve the purpose for which J. N. Tata and his successors conceived them. They not only produced and supplied essential materials and products to other industries but also created amongst Indians of all classes a resurgent belief and confidence in themselves and in their ability to stand on their own feet and, by making them impatient of existing conditions, they strengthened the freedom movement and quickened the country's march towards independence.

However we may judge the part that Jamsetji Tata played in the national events of the last hundred years, there can be no question about his role and influence in the life and growth of the Firm which bears his name. To this day, the memory of Jamsetji and what he stood for

* See Appendix D

burns brightly for all within the Organization. Although time has blurred the edges, his presence, wise and benevolent, is still felt in many ways. The traditions which he set, the values which he established are still cherished and defended. On innumerable occasions, I have been struck by the devotion to his ideas and ideals expressed by individuals, high and low, in the Firm. Even simple workers in Tata Companies seem to have been touched by the magic of his name and to have realized intuitively how much they owed to him. Of all the tributes paid to Jamsetji in his lifetime and since his death, none, I think, has been more striking or would have touched him more than the voluntary demonstration of affection and gratitude on the part of thousands of workers in the Tata Textile Mills at Ahmedabad and Bombay who, on their own initiative, recently raised from amongst themselves the funds to erect bronze or marble statues of the Founder. Every year at Jamshedpur and elsewhere on the anniversary of his birth, thousands of workers garland his statue in grateful homage to his memory.

It is, however, within the counsels of the top management of the Firm that his continuing influence and leadership are most felt, and half a century after his death, important decisions and policies are still measured against his ideals and the traditions set by him. If to this day his policies continue largely to be followed, it is not merely out of personal loyalty to the memory of a great leader but because, despite the passing of time, his basic philosophy and his ideas on industrial management have been found to be sound and applicable even to the changed circumstances of the present day. His anticipation of modern thinking is a continuing source of surprise and admiration to the present generation of Tata management; his emphasis on the application of science and modern techniques and methods in industrial management; his generous and yet realistic understanding and acceptance of the needs and rights of workers at a time when they were frequently exploited in the West as well as in India; his insistence on absolute standards of

integrity; his sense of trusteeship and his realization that to survive and prosper, free enterprise must serve the needs of society are all remarkably in tune with modern thinking and with the ethical and social standards of the most advanced societies of today.

If the House of Tata survived some exceptionally difficult times and prospered and continued to grow both in size and stature, I sincerely believe it is because throughout it held fast to the principles and ideals of J. N. Tata. I further believe that if a greater proportion of the private sector of business and industry in India were to adhere more closely to like principles, the prestige of free enterprise and public confidence in it would be higher than it is and it might suffer less from restrictive legislation and controls than it does today.

In 1895, when a new extension of the Empress Mills was opened, Jamsetji Tata said: " We do not claim to be more unselfish, more generous or more philanthropic than other people. But we think we started on sound and straightforward business principles, considering the interests of the shareholders our own, and the health and welfare of the employees the sure foundation of our prosperity ". That is not an original or a remarkable statement but it will be of interest to contrast it with an equally frank statement made by someone else ten years later. During a conference in London with Tata's representatives in 1904-5 regarding concessions in freight rates for bulk conveyance of raw materials, iron and steel, the Managing Director of the Bengal-Nagpur Railway said: " It does not appeal to us at all if you can only show that in an indirect and remote way this would be for the benefit of India. The only appeal that can be made to us is that we can make money out of it. This Railway Company, you must always bear in mind, is a commercial undertaking, and must not be actuated by anything like patriotic or philanthropic motives; it must only be actuated by commercial motives. We must not consider the advantages to India and, figuratively, we do not care a snap of the fingers about the advantages to India. What

we have to think of is the interests of the Company as a commercial concern ".

It is not difficult to judge which view has prevailed in both Western and Eastern practice. " Sound and straightforward business principles," they go to the root of the matter. Jamsetji Tata spoke then, as he spoke always, with modesty, directness and robust good sense. Not the least of his remarkable gifts was a way of going straight to the heart of a matter. Yet this practical man and realist was always to take the far view, to seek not quick returns but the ultimate benefit of India in his schemes and plans; to have in his make-up a good deal of the visionary and dreamer. Men of business are not often at home in the world of ideas; it was Jamsetji's distinction that he lived in both worlds, the world of ideas and the world of action.

It was because Jamsetji Tata lived in the world of ideas and had imagination that he played the role of pioneer in India in another direction—that of constructive philanthropy. Alms-giving and doing good to others are as old as human history, but new ideas, current in the latter half of the nineteenth century directed much of such activity towards higher education and the spread of education. Men began to recognize the importance of science and engineering for answering the needs of a rapidly changing world. The new philanthropy turned in every conceivable direction to pioneer schemes of human welfare and to increase human knowledge. It led, in the United States and in Europe, to the establishment of great foundations whose names are household words.

Amongst the great pioneers was Andrew Carnegie, whose life and outlook bear a resemblance to those of Jamsetji Tata, and who was roughly his contemporary, though the Scotsman lived to a much greater age. I believe Tata would have heartily subscribed to the social philosophy of Carnegie which is embodied in the following words: " This, then, is held to be the duty of the man of wealth; to set an example of modest, unostentatious living, shunning display or extravagance; to provide moderately for the wants of those dependent upon him; and, after

doing so, to consider all surplus revenues which come to him simply as trust funds, which he is called upon to administer . . . the man of wealth thus becoming the mere trustee and agent for his poorer brethren."

Jamsetji started sending brilliant young men abroad for higher education in 1892. In 1898 he made an offer of three million rupees for an institution of higher learning in India. At the value of the rupee in those days, this was a considerable sum by any standard. Nothing of this magnitude had been known in the country but what was truly significant was the breadth of outlook that characterized the intended gift. Notwithstanding the substantial philanthropic grants he made in his lifetime, Jamsetji left a considerable fortune to his sons Dorab and Ratan. It grew further in their hands as, with vigour and ability, they brought to life the great projects planned by their father. They too made large grants in their lifetime and, on their death, left the whole of their fortune in philanthropic and charitable endowments which, today, hold about three-fourths of the capital of the parent firm, disburse funds over a wide range of objects and in their policies bear ever in mind the spirit and outlook of the Founder. The wealth gathered by Jamsetji Tata and his sons in half a century of industrial pioneering formed but a minute fraction of the amount by which they enriched the nation. The whole of that wealth is held in trust for the people and used exclusively for their benefit. The cycle is thus complete; what came from the people has gone back to the people many times over.

To sum up in a few words the life of J. N. Tata and the lessons to be drawn from it is a task I shall not attempt, That he was a man of destiny is clear. It would seem. indeed, as if the hour of his birth, his life, his talents, his actions, the chain of events which he set in motion or influenced, and the services he rendered to his country and to his people, were all predestined as part of the greater destiny of India.

Bombay, *14th June, 1957.*

INTRODUCTION

BY SIR STANLEY REED, KT., K.B.E., LL.D.

In the pages which follow, Mr F. R. Harris has written a lucid and complete narrative of the life and work of Mr J. N. Tata, but Mr Harris, as he points out in his preface, never met Mr Tata, and has therefore called this book a chronicle and not a biography. Now Jamsetji Tata was a man understood only by those in his confidence. Without being in any sense of the word a silent man, he was no talker. He never made a public speech in his life. He opened his heart to his friends and his colleagues; but in relation to the public he preferred that his acts should speak. He wrote few letters, and kept no full diary. It has therefore been a difficult task to prepare even a chronicle of his life and activities; it has been impossible to anyone not directly associated with him to appreciate and explain the governing purpose of his work. Now the mere tale of his accomplishments is an imposing record of a full life, but it reflects only the lesser side of that life. To understand him, and his work for India, it is imperatively necessary to realize not only what he did, but why he did it. His was a life devoted to the service of India, and the object of this introduction is to try and reveal the dominant purpose of this life of patriotic endeavour.

Nearly thirty years have passed since I first met Mr Tata. That impression is still vivid in my memory. It was on the steps of the great house which he reared on the Bombay Esplanade. He was then full of the project which ultimately took shape in the Indian Institute of Science at Bangalore. He had studied the development of scientific inquiry and research in every country in the world, and was much impressed by the virility of the Johns Hopkins Institute at Baltimore;

it was my purpose to glean from him and his brilliant lieutenant, Mr Burjorji Padshah, some account of the working of that establishment for publication in the *Times of India*. The scene is still vivid in my mind. I met Mr Tata in the portico of his house. A little under the average height, dressed in the white surtout and trousers and wearing the peculiarly-shaped turban which has become almost the national costume of the Parsees, he typified rugged strength and determination rather than imagination. His was essentially a sturdy figure; his voice was sonorous and rather harsh; he conveyed to my mind an impression of the energy and force of the man of action rather than that of the industrial seer. It was only when I got to know him better that I was able to appreciate the far-reaching national ideals which governed all his industrial work. From that time forward it was my privilege to be associated in a very modest capacity with the unceasing efforts of his sons and his associates to give concrete expression to the plans he nourished for the economic stability and prosperity of India. Twenty years have passed since his death, and as ours is a generation of short-lived memories, I have endeavoured to supplement this chronicle with some brief exposition of his doctrine of service.

Every man worth his salt is imbued with the spirit of service, and in India this ideal still constitutes the great passport to the affection and respect of her people. That springs not only from the inherited ideals of the Hindu faith, but from a vivid appreciation of the intense need of India for service in every field of national life. With a mighty past which carries her civilization back to the dawn of history, she has, from various causes, been outstripped in the industrial race by the nations which were quicker to seize and apply the potentialities of mechanical invention. But in the more contemplative Orient, the ideal of service has been too largely associated with politics. That was perhaps inevitable in the political conditions of India, but it tended to cramp the expression of her national forces.

Mr Tata was keenly interested in politics; he numbered amongst his intimate friends many of those who laid the foundations of the new public life of India. He was fully alive to the value of the work of the social reformers, and his house was always open to them and their coadjutors. But he chose for his own field the broadening and the strengthening of the economic foundations of Indian society, and to that work he bent the whole energies of his forceful character and vigorous mind. Almost alone in his generation he realized that, if these foundations were to be secure, empiricism must give place to science, and that the economic structure must be broad-based on a diffused knowledge of industrial science; it is in this spirit, inculcated by him, that those who succeeded him have tried to carry on his work.

I can imagine the cynic raising his eyebrows at the thought that the pursuit of wealth through the development of industry can be dominated by the idea of service. Indeed, who has not heard sneers at the suggestion that the acquisition of wealth can have any other object than the mere mechanical swelling of a fortune already large? But to ignore the missionary spirit in business is to be blind to one of the strongest forces in the world; to fail to discern the patriotic objective in Mr Tata's enterprises is to miss the real lesson which the life of this great Indian has for the present generation. To say this is not, of course, to pretend that the possession of wealth, and of the amenities which wealth commands, meant nothing to Mr Tata. He was an open-handed spender. He built himself a great house, the first of the new merchant princes of India to be nobly housed. Whilst his own tastes were of the simplest, he enjoyed dispensing a liberal hospitality, especially in the direction of bringing persons eminent in all walks of life together under his roof. He was a great traveller and an avid buyer; his travels were punctuated by the arrival of cases containing his purchases in ever quarter of the globe. But once the foundations of his fortune were firmly established by

the assured prosperity of the Empress Spinning and Weaving Mills at Nagpur, wealth was to him not an end, but a means to an end, the increased prosperity of India. And even in the formative stages of his life his restless spirit was never content with treading the conventional path. Whilst others could not look beyond adding mill to mill in what soon became the overcrowded narrow island of Bombay, he bent his energies to erecting machinery in the immediate vicinity of the cotton fields of Nagpur, where the raw material and a market were at the gates of the mill. Whilst others were content to grind out quantities of low-grade yarn for the China market and rough cloth for the Indian consumer, he concentrated on the production of finer yarns and better cloths, and envisaged the markets of the Levant as well as those of the Far East.

When he surveyed the almost untilled industrial field of India with the knowledge won from a hard industrial struggle, and the power accruing from the wealth success had brought him, Mr Tata came to three main conclusions. They were, that no country could become industrially great which did not manufacture iron and steel; that no sustained economic growth was possible, without the provision in the country itself of the means for winning a first-class scientific education; and that the prosperity of his own adopted city, Bombay, could not be regarded as secure so long as it was entirely dependent on coal brought thirteen hundred miles by rail or sea from the remote fields of Bengal. From this realization sprang the three enterprises with which his name will always be associated—the iron and steel works at Jamshedpur; the hydro-electric schemes which are making Bombay virtually independent of coal and furnishing it with an abundance of cheap, clean power; and the Indian Institute at Bangalore, which aims at giving to Indians post-graduate education in science second to none in the world. To this triple project he devoted the closing years of his life and no small

proportion of his fortune. It was not given to him to see the results. He died before any of the three schemes had reached fruition. But one of the surest means of deciding whether any man is entitled to that rare appellation 'great', as distinguished from just successful, is his power of selecting the right colleagues and of inspiring them with a kindred purpose. By the time Mr Tata's own life was spent, the foundation work had been so well and truly accomplished, his sons and lieutenants were so firmly imbued with his own ideals, that the momentum he had given to these great ideas drove them irresistibly forward. His sons, and in particular his eldest son, Sir Dorabji, regarded the execution of their father's projects as a solemn filial obligation; his lieutenants were proud to devote their lives to the completion of the work of their revered chief. Others reaped, but he sowed; the harvest is as assuredly his as if he had actually garnered the fruits of his careful, courageous, and imaginative sowing.

In all these activities Mr Tata was essentially Indian; he envisaged the whole field of Indian economics, and his plans knew no other geographical limitation. He was at the same time a splendid citizen. There is something in the air of Bombay which inspires an intense civic pride, and of this Mr Tata was a notable exponent. He did not interest himself, except in a minor degree, and in so far as they affected his own schemes, in the municipal government of Bombay. That he left to his friend Sir Pherozeshah Mehta, whose name is as closely associated with the modern corporate life of Bombay as that of Joseph Chamberlain with Birmingham. But he was passionately proud of the city, unbounded in his confidence of its future; he revelled in the task of beautifying it with noble buildings and in improving its amenities. The conspicuous evidence of this pride is the Taj Mahal Hotel. Someone made the casual remark that Bombay had no good hotel, and, chafing under the imputation, Mr Tata decided to build one. He spent nearly £300,000 on the enterprise without

any hope of a commercial return, and never regretted it because it was for the service of Bombay. Looking back on the catholic schemes which he devised for the improvement of Bombay, one is tempted to rejoice in the fact that his days synchronized with the administration of a rather 'sticky' Government, a Government which, still imbued with the rather jealous dislike of 'interlopers' which came down from the days of 'John Company', looked askance at the restless improver. There was scarcely an undeveloped corner of the island which did not come within the range of an eagle eye, which roamed not over the island proper, but took within its gaze the creek which separates it from Salsette and the salubrious slopes of the adjacent island which is the natural hinterland of Bombay. If Mr Tata had been dealing with a quickly responsive Government—with an administration which met him half-way—he would possibly have become so committed to local enterprises that he would not have had the means and the energy to prosecute the greater national schemes with which he is specially identified.

Looking back over the years of my life in India which have seen the House of Tata burgeon from cotton-spinning and general trading into the development of foundation industries like the manufacture of iron and steel, the production of hydro-electric power on a huge scale, and the creation of an Institute which provides trained scientists to man her existing and nascent industries, it seems to me that this is the spirit in which Mr Tata and those he inspired worked. He was not in the least indifferent to money, nor to the things which wealth can provide; on the contrary, he enjoyed these amenities to the full. Every industrial enterprise to which he set his hand was meant to pay. But wealth was never an end in itself; it was the means to an end, the greater prosperity of India. He had a ready sympathy for honest politicians and for social reformers; he appreciated the work of those who were engaged in municipal government. But profoundly

believing that the true foundations of a State are to be found in its economic stability, he devoted the best years of his life to the establishment of the key industry of the modern world, the manufacture of iron and steel, to the evolution of Indian industry from the comparative simplicity of the conditions he found to the best scientific practice, and to the education of her sons so that they might take their part in scientifically designed and operated manufactures.

All this he did in a spirit of national service. He might have been satisfied to cultivate the field which he knew best, and to add cotton mill to cotton mill, sure of a rich material harvest. But that would have cramped Indian economic activities and have limited her economic development to one or two industries. Nothing so small contented him. He surveyed the economic field as a whole, and determined that so far as power was given to him it should be used to raise India to one of the great industrial countries in the world, and that her industries should be based on the application of science to production. He was a business patriot in the full sense of the term. These are the qualities which give him an assured place amongst the makers of modern India, and a foremost position in the Valhalla which enshrines the eminent Victorians who laboured to prepare India for the full nationhood which is so passionately desired.

AUTHOR'S PREFACE

BIOGRAPHIES of business men are few in number; for the life of a merchant, whose daily routine revolves between home and office, is a subject which rarely stimulates the pen. Yet there may be a message for others in the lives of these merchant princes; in the slow and arduous steps by which they first attain a sight of their goal, and in the long and powerful strides with which they continue their journey until the goal is reached. Those who lack certain traits of character often fall by the way, for Fortune makes prodigious demands upon her wooers. The men upon whom she smiles must needs acquire frugal habits, must overcome difficulties in dauntless fashion, and must pursue their aims with unswerving purpose. Their life story is, in the main, one of achievement, but frequently a man is found who not only amasses wealth, but who devotes his leisure to the finer arts, or spends it in the proper distribution of his riches.

Such men cease to be purely men of business, and stand on a higher plane than those whose constant pride is vested in the sums they leave behind, and in the valuation of their estate for purposes of probate. The disposal of a large fortune is as much a matter of interest to the public as it is to those, more nearly concerned, who assemble for the reading of a will.

Jamsetji Nusserwanji Tata was one who knew how to acquire and how to dispose of a fortune. He had all the qualities which make a successful man of business: he was honest, resolute, and cautious, but he could bring courage and imagination to bear upon his schemes.

Twenty years have elapsed since his death, and, now that this account of his work has been so long delayed, his plans can be considered, not only as he left them, but as a tribute to his foresight and the efficiency of those who were associated with him.

Various vicissitudes have delayed the publication. The task was originally undertaken by Mr Lovat Fraser, who knew Mr Tata, and the chapters on Iron and Steel, incorporated in this volume, were published in 1919 as a preliminary instalment. His fuller estimate of Mr Tata can be gleaned from his book, *India Under Curzon and After*. In 1920 the completion of the record was entrusted to the present writer, but a severe illness interrupted the work.

This book is a chronicle of Mr Tata's life rather than a biography. To one who never saw him, the material by which his own thoughts and opinions might be gauged is but scanty: a fragment of a diary, a single letter-book, and a few loose letters are all that can be found. Except for the first, this material relates, as a rule, to business matters. Most of his private letters were destroyed, but his son, Sir Dorabji, has furnished the author with many valuable particulars of his father's life. Other members of the family and the firm, some of whom were in constant touch with Mr Jamsetji, have given to the author much useful information. Though their names are not mentioned in detail, the writer is none the less grateful for the assistance which they rendered to him. One in particular, Sir Bezonji Dadabhai, who for twenty-five years worked side by side with Mr Tata, should, however, be specially mentioned; for he wrote a most valuable account of the history of the Svadeshi Mill, its struggles and its success, which forms the basis of Chapter III. Another old associate of Mr Jamsetji, Sir Dinshaw Wacha, sent to Mr Fraser some notes on their early connexion, and his biography proved a most useful guide to the present writer. During the later stages of the work a few inquiries were most courteously answered by the late Marquess Curzon of Kedleston, and the Superintendent of Records at the India Office.

Jamsetji Tata was a man of great achievement, far-seeing and circumspect. His resolute will enabled him to elaborate projects which his imagination con-

ceived upon the largest scale. He was at once a business man, a patriot, and a thinker, whose service to India was as great as his love for her was profound.

'There can be no better use for money,' said a writer, 'than to spend it in spreading the knowledge of a noble life.' Inadequate as this chronicle may seem, it may perhaps suffice to tell the reader that which Mr Jamsetji did for India, for Bombay, for education, and for the industrial welfare of his country.

F. R. HARRIS

May, 1925

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CHAPTER I

THE FIRST STEPS

1839–76

DURING the nineteenth century a number of men in the western world amassed considerable fortunes, and handled such vast and varied interests that they formed a new class of society. Some had expanded hereditary concerns; some were self-made men, but they had the help of an economic system which had been developing since the latter half of the eighteenth century. They had gained by the experience of their predecessors; they had ready access to the most modern machinery, rapidly growing facilities for transport, an abundant supply of skilled and organized labour, and they could rely upon the assistance of governments intent upon industrial expansion.

In the East conditions were wholly different. The economic system was that of medieval times; machinery was scarce, or old and carelessly kept; the methods of transport were primitive; labour, though abundant, was poor in quality, for the workman was ignorant, superstitious, and hardly to be trusted with the most rudimentary machine. India, as a whole, was a century behind her rivals, until the opening of the Suez Canal, the building of the railways, and the introduction of the telegraph somewhat reduced the handicap from which her industrial life had hitherto suffered.

Those who most rapidly acquired a prominent position in Indian commerce were, many of them, Parsees, and it fell to the lot of a quiet little town to become the birthplace of one of their greatest industrial families. Navsari lies some twenty miles from Surat, in the territory of the Gaekwar of Baroda. For several centuries it remained the stronghold of numerous Zoroastrians, who kept alight the sacred fire, and for

over eight hundred years Navsari had been the headquarters of the priestly families of the Parsees in Western India.[1] Each of these families was entitled to a share of the offerings brought to the temple. As the son of a Parsee priest passed to the degree of Navar, his name was, with becoming ritual, added to the pedigree of his forefathers.

For upwards of twenty-five generations the names of the Tata family, and its ancestors, have been inscribed side by side with others upon the priestly rolls.[2] Fourteen generations have seen the light since one of the ancestors, Behram, took the name of 'Tata', probably a nickname denoting 'hot-tempered'. His descendants admit that the Tatas are somewhat 'peppery'. A document, still in existence, shows that Behram's son, Pudum, was in possession of the family house, which adjoins the property of the High Priest. In the year 1822, one, Nusserwanji Tata, was born at Navsari in humble circumstances, though his grandfather was a prominent and highly respected townsman, who acted as right-hand man to the Desais, the governors of the district, under the Gaekwar. When, wearing a white head-dress, he came on to the veranda to recite his prayers, there was not an inhabitant of the town who would pass by and disturb the old man at his devotions.

As a rule, these members of the priestly class preserved a tradition of asceticism which curbed their ambition, and made them content with little more than a few annas to furnish their simple needs. Nusserwanji Tata was cast in a different mould. When quite a boy he learned the rudiments of business from a country banker in Navsari, and shortly afterwards migrated with his father to Bombay. At the outset he was apprenticed to a Hindu banker and general merchant, from whom he acquired both a considerable knowledge of the primitive weights and measures then in use, which varied from

[1] *The Genealogy of the Navsari Parsi Priests*, Ervad R. J. D. Meherjirana. (Privately printed in India.)

[2] See the genealogy of the Tata family (Appendix C).

district to district, and of the most suitable localities in which to buy certain commodities, knowledge which stood him in good stead in later life. He was a sharp lad, able, resourceful, and intelligent, whose natural shrewdness counterbalanced his lack of education. Possessed of these traits, Nusserwanji was not for long content with his modest opportunities. Honest and frugal, and endowed with the business instinct of his race, he saved a little money which soon enabled him to become the first of his family to do business upon an extensive scale.

A chance prediction may have encouraged his earlier efforts. At the time of his childhood the town of Navsari consisted solely of the single-storeyed houses, such as the one in which he was born. When Nusserwanji was a little lad, a fortune-teller picked him out from his companions, and said: 'This boy will travel, he will become rich, and build a house with seven storeys.' His friends laughed loudly at the prediction, and teased Nusserwanji about the storeyed house. 'Where are you going to build it?' they cried. Yet many of them lived to see the prophecy fulfilled, for as soon as Nusserwanji Tata was fairly prosperous he bought a large hosue in Bombay, in the Fort District, and built it up to a seventh floor. Once possessed of ample means, he also travelled, as the soothsayer had said, and was among the first foreigners to set foot in Japan.

At five years of age, Nusserwanji was one of ten bridegrooms whose marriages took place on the same day, with the hand-clasp and throwing of rice between bride and bridegroom which form part of the Parsee rites. He was but seventeen years of age when his only son, Jamsetji Nusserwanji Tata, was born at Navsari.[1] The boy was, in his turn, initiated into the various rites of his religion; he served his novitiate, and his name was inscribed among the priestly records. Of his early life little is known. Education at Navsari was in a

[1] The Persian form of the name is Jamshedji, but Mr J. N. Tata always signed himself Jamsetji.

primitive stage, consisting, in the main, of verbal instruction in the Zoroastrian prayers and scriptures, and it was well for Jamsetji that, when he was thirteen years of age, his father called him to Bombay. There he attended the casual classes of various pundits, and then passed on to a vernacular school, where he learned something of the 'three R's'. At fourteen years of age he joined the Elphinstone Institution, and in January, 1856, he was enrolled as a 'free student' at Elphinstone College.[1] There the youth whose industry and quickness of mind were already remarkable, received a liberal education, and acquired a love of reading which lasted throughout his life. So absorbed was he in his work that he left little impression upon his fellow-students, and confined his acquaintance to a very small circle. In later years he gave an annual dinner for the Elphinstonians of his day, among them his earliest contemporaries, Ramkrishna Bhandarkar, who was afterwards knighted, and Dinshaw Wacha, who thirty years later was associated with Jamsetji Tata in business, and paid tribute to his memory in a short and affectionate biography.[2]

While a student at Elphinstone College, young Jamsetji had a narrow escape from death. He resided with his father in a small house in the Fort, using the topmost room as his study. It was a tiny apartment, a little attic tower, so close to the roof that during the monsoon he could scarce hear himself speak, owing to the noise of the tiles which rattled above his head. On one occasion, during a terrific cyclone, when many ships in the harbour dragged their anchors and sank, his father rushed up from the floor below, insisting that Jamsetji should leave the house. The son obeyed, and tore himself from his books, to find the streets filled with an excited and shrieking crowd. Suddenly the nook

[1] Extract from the register of Elphinstone College. A 'free student' was one who, though failing to obtain a scholarship, showed sufficient promise for his fees to be remitted.

[2] *Life and Life Work of J. N. Tata*, by Sir D. E. Wacha.

(1861)

(1869)

(1883)

(1885)

J. N. TATA (1861-85)

facing p. 5

he had occupied was torn away by the force of the wind, to come crashing down at his feet.

In 1858 Jamsetji Tata's career at Elphinstone College came to an end. He passed out as a 'Green Scholar', which was then the equivalent of a degree. He had intended to follow one of the learned professions, and entered, for a time, a solicitor's office, but, fortunately for Indian industry, necessity compelled him to go into business. While still a student, he had married a Parsee girl of the priestly class, five years his junior—Heerabai, the daughter of Cursetji Daboo. This early marriage soon brought him new responsibilities; he was but twenty years of age when his elder son, Dorabji, was born at the house of Mr Tata's mother-in-law, as Parsee custom dictates. In 1859 Mr Jamsetji entered his father's business. The firm of Nusserwanji and Kaliandas, general merchants, consisted of a few working partners, who, in 1857, had made some money as contractors for the commissariat during the occupation of Bushire. The remaining members so completely trusted Nusserwanji Tata that they deemed no form of agreement to be necessary, and always received their due share of the profits. With his father to guide him, Jamsetji gained experience of various commodities and markets. Throughout life he was convinced that a liberal education such as he had received could be of great advantage to a business man; in his own case he so quickly mastered the intricacies of the exchange, and fitted himself for a responsible task, that he was able, within a few months, to take up the work of developing the China trade for his father's firm.

In December, 1859, a new branch was opened in Hongkong under the name of Jamsetji and Ardeshir, retaining, however, the connexion with Nusserwanji and Kaliandas. The firm took an office in Holywood Road which their successors occupied for fifty years. The principal partners were Nusserwanji Tata, Kaliandas, and Premchand Roychand, who had not then attained to any great position in commercial life. They dealt

mainly in cotton and opium, imports which yielded handsome profits. In return they sent to India consignments of tea, silk goods, camphor, cinnamon, copper, brass, and Chinese gold. The young Jamsetji Tata was dispatched, in company with his friend, Hormusji Saklatvala, to lay the foundations of the China house. After a few months in Hongkong, Jamsetji went on to Shanghai, and there established another branch. He joined the volunteers, and obtained a brief experience of soldiering, but most of his time was devoted to the work of acquiring a thorough knowledge of the eastern markets. On his return to India in 1863 he retained a share in the firm, until, through the subsequent failure of Premchand Roychand, the China business was temporarily discontinued.

So far Jamsetji Tata had not experienced any of the vicissitudes of business life, but at the time when he left the Far East, Bombay was drifting towards a financial crisis. The American Civil War had presented India with a brief spell of fortune, which her merchants had visualized as the beginning of a period of perpetual prosperity. A sudden access of abundant wealth turned their heads. For a time Indian-grown cotton fetched enormous prices, and reached a market which, in times of peace, rejected it for better-quality staples. Deeply sympathetic with President Lincoln and his cause, the Lancashire operatives were prepared to starve rather than allow the Southern States to send them the raw material for their mills. It was India's opportunity, and as the price of cotton steadily rose, her merchants were able to make a profit far in excess of their wildest dreams.

Had they been content to conserve their profits all might have been well, but a wave of speculation overwhelmed them. Immense prices were realized upon shipments of cotton to Liverpool. Those who were content to make money in this simple fashion could do so with ease, but for many a man the temptation to multiply his gains was so great that the boom attained

the character of a nineteenth-century South Sea Bubble. Gold and silver poured into Bombay in such profusion, that money soon exhausted the legitimate channels of investment, and overflowed into a multitude of crazy concerns.

Unfortunately the firm of Nusserwanji and Kaliandas had an over-ambitious partner. Premchand Roychand was soon immersed in a variety of interests. He was a distinctly able man. At the outbreak of the American Civil War he was but thirty years of age, yet in a short space of time he became the most deeply engaged financier in Bombay. He began his speculations as a cotton broker, and rapidly acquired the necessary credit with bankers and merchants. Then came the boom. Within the next four years the exports of raw cotton rose from 835,000 bales to nearly twice that figure, and at largely enhanced prices. The firm of Nusserwanji and Kaliandas established their agents in the various cotton-growing districts, and greatly enlarged their control of the markets. Their cotton transactions were innumerable, for they acquired an interest in several smaller houses. Flushed with success, Premchand Roychand speculated lavishly in land reclamation, or in real property, and took a hand in hazardous flotations of every kind.

In 1863 he was the moving spirit in the establishment of the Asiatic Banking Corporation. The favourable balance of trade had increased India's imports of gold and silver by so many crores of rupees that the banking business appeared to be an excellent investment. Asiatic Banking shares were soon at a premium of 65 per cent, for the Corporation had begun life in circumstances which appeared most favourable. Others caught the speculative fever. The Bank of Bombay, which had hitherto advanced money only on Government securities, doubled its capital, and altered its charter so that advances might be made to private firms. Within a few months a dozen ill-starred banks were founded. Money was lent upon every class of security, and though the

Bombay Chamber of Commerce uttered a warning note, the warning passed unheeded.

It was, however, some time before the crash came. Meanwhile Premchand Roychand decided to establish a London agency for his firm, and invited his partner's son to undertake the business. Jamsetji Tata had not been back in Bombay for any length of time before he was the victim of one of those disagreeable incidents which are fortunately becoming rarer in Indian life. During the festivities arranged to celebrate the marriage of the Prince of Wales, Mr Premchand, Mr Tata, and his son Dorabji, then a boy of four, went to the Maidan to witness a display of fireworks. The Oval was enclosed, and all the seats were reserved. In the middle of the display Mr Premchand, who was then at the height of his power, left his place in order to talk to a friend. An over-zealous official, searching for a seat for some English ladies, seized Mr Premchand's chair and attempted to carry it away. Mr Jamsetji at once protested. The Englishman became angry, and, with an outburst of discourtesy, tried to brush him aside. A quarrel ensued, and the aggressor at length cried, 'Who are you to speak to me like this?' Mr Tata, however, stood his ground, though he was threatened for his obduracy with a night of confinement. But another Englishman warned the offender that he would probably get into trouble over the matter. 'You don't know what sort of man this is,' he added. Sobered by such a warning, the official became nervous, and hoped to close the incident by telling Mr Tata that he might go home; but with that quiet demeanour which never deserted him, Mr Jamsetji declined any unsatisfactory compromise, and preferred to spend the night under arrest, though he was speedily granted bail. Knowing he was in the right, he insisted upon a full and frank apology, which was brought about by the friends of either side, without further scandal.

As far as Mr Tata was concerned, such an incident was exceptional, but he was always indignant at any sign of racial distinction which he deemed unfair. Careful

of his dignity, he gained the respect of every Englishman with whom he came into contact, and counted many among his intimate friends. To those he conversed with freedom, and though he rarely referred to the unfortunate affair of 1863, it may have been in his mind when he said, thirty years later: 'If some Englishmen treated us more considerately, there would be more harmony than there is. . . . It is in the clubs and institutions that a certain amount of antipathy is stirred up, and that is all.'[1]

If, at the time, an unfortunate impression of racial distinction was left upon Mr Tata's mind, it was dispelled by the treatment which he received on his first visit to London and to Lancashire. Mr Premchand Roychand's firm was shipping cotton to Liverpool in large quantities, and needed someone to look after the consignments. Arrangements had also been made for the establishment in London of a branch of the Asiatic Banking Corporation. Early in 1864 Mr Tata set sail for England to represent his firm. He carried a number of securities, including a sheaf of bills on the China market. While he was still at sea, the first fissures of the coming crash appeared in the financial structure. The bills which he carried speedily became worthless or depreciated. He had advised his firm to sell their cotton at once, but they held on for a further rise. It was too late. Soon after Jamsetji Tata landed the price of cotton went down with a run. Premchand Roychand had failed.

Few men of Mr Tata's age have ever found themselves in a more unenviable position. He was a stranger in a strange land, at a time when traffic between the business men of East and West was still somewhat rare. He had arrived in England bearing scrip, which he hoped would prove not only negotiable but profitable security. He found his pockets stuffed with waste paper, his credit impaired, and the good name of his firm already at stake. It required a stout heart, a clear brain, and a steady

[1] *Ceylon Independent.* In an interview, February 1899.

character to meet such a situation. Fortunately for his firm, Jamsetji Tata possessed all these requirements. He put the position before his creditors, and before the banks, so ably and so frankly that they, impressed with the honesty of the man, appointed him his own liquidator, with an allowance of £20 a month. In 1862 a director of a creditor firm, Mr J. H. Gwyther, afterwards a well-known banker, met Mr Jamsetji in Shanghai, and had formed a high opinion of him. When the work was completed, Mr Gwyther said to him, 'Young man, you will go far'; a prediction which was speedily verified. The crisis through which he had passed left an indelible mark upon Mr Tata's character, and confirmed in him that need for caution which formed his guiding line in after life.

The business of liquidation did not occupy the whole of his time, for belated shipments of cotton were still arriving, and he had to dispose of them as best he could. He was frequently in Lancashire, where he obtained his first insight into the working of the cotton trade, and seized the opportunity of gaining that knowledge which he afterwards put to so good a purpose. On his return to Bombay he assisted in saving some salvage from the wreck. Though Premchand Roychand was almost ruined, Mr Nusserwanji Tata was not so deeply involved in the smash. He had, however, to retrench. He sold the 'storeyed-house' in Hornby Road, and by sacrificing his personal property he soon succeeded in paying off his creditors. Three uneventful years of hard work awaited father and son; but during that time they re-established their credit, and were ready to take advantage of any favourable turn of Fortune's wheel.

They had not long to wait. Within a few months the course of events favoured their particular business. In 1867 the ruler of Abyssinia, who for some years had nursed a fancied grievance against the British Government, imprisoned, in arbitrary fashion, a handful of British subjects. Repeated requests for their release were deliberately ignored. An ultimatum proved unavailing,

and resort to arms appeared the only solution. For the proposed expedition it was decided to employ Indian troops under General Sir Robert Napier, Commander-in-Chief at Bombay.[1] His force of 16,000 landed from the Gulf of Aden, and marched rapidly on the capital. In the spring of 1868, without excessive bloodshed, Magdala was taken.

The contract for the commissariat of this brief and brilliant expedition was obtained by Nusserwanji Tata in association with several merchants who dealt in the various commodities needed for the army. Mr Nusserwanji was well acquainted with the needs of the Indian troops, who, in an unhealthy climate, had to traverse many miles of sandy plain before reaching the ridge of hills upon which the capital stood. The syndicate supplied the means of transport, and all the paraphernalia of water-casks and skins, blankets, food, and wine for a whole year. With his natural shrewdness Nusserwanji had substituted disused kerosene tins for expensive casks, as more convenient to sling across the mules in traversing the narrow passes. Napier's rapid success was a great benefit to the merchants concerned. He had demanded supplies sufficient for twelve months, and had completed his expedition in half that time. He had made provision with a lavish hand. The cost of relieving thirty captives amounted to some £10,000,000.[2] Out of this sum the profits of the contractors and sub-contractors were considerable: the members of the syndicate found themselves the richer by forty lakhs of rupees. Nusserwanji Tata, who had never liked the business of a contractor, was able to retire, and he and his son, who had already made his own plans, could now divert their activities into other channels.

Soon after his retirement the older man was seized with a serious illness, and lay for a time at death's door. On his recovery he went for a lengthy tour in China, and thence to Japan, which had recently been opened to

[1] Afterwards Lord Napier of Magdala.

[2] The original estimate was about £1,000,000.

foreigners. Imbued with the family failing of buying, he brought back to India several cases of porcelain and curios, novel to his country. With these he adorned his house, and laid the foundation of a collection of oriental ware and art, an expensive hobby in which his son and his grandsons also indulged. Interested though he was in these purchases, he did not forget the family; his grandson, Dorabji, well remembers the great Chinese kites with which the grandfather amused him. As head of the house, Mr Nusserwanji employed some of his money for enlarging the home at Navsari. In 1872, after an interval of twenty-seven years, he at length revisited his birthplace, and marked the occasion by a cheerful house-warming. The fame of his reconstructed residence spread far and wide. By contrast with its neighbours, the dwelling seemed palatial, and people flocked from miles round in order to gaze upon the exterior. Impressed with what he heard, the reigning Gaekwar of Baroda, Mahalar Rao, paid Mr Nusserwanji a visit. At its conclusion he went away delighted with the novelties, and laden with gifts of his own selection. In after years, when Nusserwanji's elder grandson visited the reigning Gaekwar at Baroda, he recognized several of the treasures which his grandfather had given away.

While in China, Nusserwanji Tata revived the eastern branch, which had been established by Nusserwanji and Kaliandas. Aware that the fortunes of many of the great Indian mercantile houses had been built up on traffic with China, he deeply regretted the winding-up of the business during the share mania. Now that the House of Tata was ready for expansion, Mr Nusserwanji judged that the time had come for reopening the branch in Hongkong. The Tata family had connexions in the China trade, for two of Mr Nusserwanji's brothers-in-law, Dadabhai and Sorabji Tata, had succeeded their father in a small, but long-standing export and import business between Bombay and the Far East. Mr Dadabhai had been chief cashier and accountant

NUSSERWANJI TATA

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in Mr Nusserwanji's first venture. After the crash in 1865 he had retained the lease of the premises, and founded a firm called D. C. Tata, doing a profitable trade in the opium shipped by his brother, Sorabji, and in the silk goods which he, in turn, exported to Bombay. When Nusserwanji Tata found that his brothers-in-law had established a sound connexion, he arranged to expand it by financing a new firm in the old buildings in Holywood Road, under the designation of Tata and Company.

He then placed Mr Dadabhai Tata in charge. A half share in the business was assigned to himself and his son Jamsetji, in the latter's name; Dadabhai and Sorabji had a quarter share, and the remaining quarter share was given to Nathuram Joravur Mull, who had already acted as broker to the firm, and had been the senior partner in Dadabhai's and Sorabji's China business. The firm, thus constituted, continued for several years with varying fortunes, but in 1876, when Dadabhai died, Jamsetji Tata and his father withdrew their capital. For a time no member of the Tata family was left in China, though Tata and Company continued as a business, on a smaller scale, with Nathuram and Sorabji as partners. The China house was then placed under a paid manager, formerly an assistant in the firm, who was made a junior partner, but his results were poor. About 1880 Mr Nusserwanji rejoined Tata and Co. in his own name, but against his son's advice, for Mr Jamsetji regarded the branch to be too remote for efficient supervision. At the time he was right. The business in China again fell off; some three years later Nusserwanji retired, and both Nathuram and Sorabji died; but from 1883 onwards, Mr Dadabhai's son took over the house, and put an end to its vicissitudes.

Meanwhile, Jamsetji Tata was steadily making preparation for his future career. His share in the profits of the Abyssinian campaign had provided him with a substantial, though not a large amount of capital. During his four years in England he had frequently

visited Manchester, and had been fired with an ambition to begin the manufacture of cotton goods. The time and the circumstances seemed to him to be favourable. At Chinchpoogly a mill, formerly used for the pressing of oil, had become bankrupt and derelict. In 1869 Jamsetji Tata determined to buy the place, and set out to form a private company for that purpose. In Lancashire he had made the acquaintance of a young and enterprising Borah merchant, named Sheikh Adam, with whom he had done a certain amount of business. He induced Mr Nusserwanji to allow him to associate Sheikh Adam and one or two others with the venture. A few friends proffered their support, and the newly-formed company purchased the Chinchpoogly property, which was renamed the Alexandra Mill in honour of the Princess of Wales. It was speedily converted into a cotton mill, with Mr. Jamsetji in sole charge. There he gained his first experience of the industry which brought him both fame and fortune. He began well. In two years' time the Alexandra Mill showed a moderate profit, and was then sold to Kesowji Naik, a prominent Bhatia mill-owner and cotton merchant.

Having disposed of the mill, Mr Tata found that his capital and his knowledge were sufficiently increased to justify the pursuit of his ambition. Before embarking, however, upon a larger venture, he determined to revisit England, and to make a more thorough study of the Lancashire cotton trade, particularly by inspecting the most modern machinery. With the object of improving his mind, he arranged to travel by way of Egypt, Syria, Palestine, Turkey, and Russia. During his journey he kept a diary, and one volume is still among his papers. The fragment, which contains an incomplete account of his sojourn in Palestine and Syria, affords a valuable picture of his delight in travel, his interest in all things great and small, and his industry in writing down a variety of observations.[1]

On 26 April 1873, Mr Tata left Bombay, accompanied

[1] See Appendix A.

by a Parsee friend whom he had known in China. A fortnight later the travellers arrived at Suez. After spending a few days in Cairo and Alexandria, they turned northwards and began their sojourn in a new land. From the moment Mr Tata disembarked at Joppa he began to jot down his impressions. Not a detail escaped his watchful eyes. The unfamiliar trees, and a spring, ' revivifying as the waters of Zem-Zem ', filled him with admiration. He soon made friends among the populace, especially with ' a couple of bright-eyed, intelligent, sturdy little children ', who ran his errands, and ' dinned Baksheesh ' into his ears. They were rewarded with a few small coins, but an old woman who pronounced a blessing on Mr Tata's undertaking received a present which, the dragoman said, exceeded the largesse of any former traveller.

Jamsetji Tata, however, had not been fortunate in the choice of a companion, for, day after day, his friend produced the ' usual grumble '. Mr Tata, at the outset, had warned the older man that, on horseback, even twenty miles a day was fatiguing for any length of time, but promised him that diversion from the beaten track of the tourist would bring its own reward. ' He was fired,' says the diary, ' by a noble ambition to be among the first of his community to visit scenes and places which others more effeminate and ease-loving never thought of doing. But this resolution was made in Cairo, with the odour of tar and bad cookery on board the steamer still fresh in his nostrils.' It is evident from Mr Tata's notes that the first three hours' riding produced a liberal crop of the ' usual grumbles '. Before the travellers had covered ten miles, the ill-chosen companion had tried alternate riding and walking—' half a dozen times expressing supreme disgust at the first taste of travel in Palestine. Ideas of returning to Jaffa at once, or, after visiting Jerusalem, began seriously to be mooted, and from that time commenced a series of grumblings and complainings which might try the patience of a Saint.'

But Mr Tata did not allow himself to be turned aside by these murmurs; the new and beautiful scenery was to him sufficient recompense for the shortcomings of his companion. Their road lay through groves of pomegranates, peaches, apricots, and oranges, 'laden with magnificent clusters of golden fruit'. The way was 'lined with a beautiful and variegated carpet of flowers'. Mr Tata took stock of all these things, for, wherever he journeyed, his heart was always with his beloved India, and he turned over in his mind the possibility of transplanting new fruits and plants to his own country. Through the Plain of Sharon, with its waving corn, the travellers passed near Lod, a town which recalled to Mr Tata the numerous legends concerning St George. But nothing served to interest his companion. 'I was quite in despair,' wrote Mr Jamsetji, 'and cursed my folly at undertaking to carry round the world the Old Man of the Mountains, until a merciful Providence, as it were, specially intervened to take my load off. At a wayside Khan, just outside the door as we passed, I noticed a curious-looking oblong box of wood, with two poles tied up to its side, as they do to a chair in China. I fortunately inquired of my Dragoman the use of this curious-looking machine. He said it was a chair for carrying ladies on their travels; that it was tied on two mules, one before and one behind. I opened my eyes, and the thought struck me that this might procure a remedy for all the grievances of my friend. The Dragoman, on inquiry, said that he probably would be able to procure one in Palestine, and I joyfully carried the news to my friend. But he had set his heart on returning, and said that having trouble enough from one horse he had no mind to trust his precious person to two mules. But after using some strong remonstrances, I induced him to promise that he would try it on an excursion we had decided upon undertaking from Jerusalem to Bethlehem.'

When they continued their journey even Mr Tata lost some of his complacence over the ruggedness of the

way. 'I suppose,' he remarks, 'the roads of Palestine are specially made rugged and difficult by a Christian Providence, to prove by a toil of actual experience that the way to Hell is paved with good resolutions.' On the evening of 21 May the travellers arrived in Jerusalem, and stayed at the Mediterranean Hotel. The next few days were spent in sight-seeing. Mr Tata varied his admiration of the City with a few shrewd and biting comments upon her inhabitants. He was highly amused by one incident. The Knights Templars, who possessed the sword of Godfrey de Bouillon, occasionally used it for conferring a knighthood upon a sufficiently credulous stranger. 'They offered me the same honour,' says Mr Tata, '(believing me to be a Christian), for a hundred pounds, but I declined it with thanks.' He was also much diverted by the sight of some nails which, according to tradition, had been in the Sacred Cross, and were now embedded in a stone some twelve inches thick. 'It was said,' writes Mr Tata, 'that the nails were making their way through it imperceptibly, and when they had all passed through, the Day of Judgement would arrive. I don't think,' he adds, 'any of them had progressed on their journey through more than a quarter of an inch, and I thanked God that the Last Day would not interfere with any of my calculations.'

A few more days sufficed for the remainder of their sight-seeing. Early on 3 June the travellers left Jerusalem. Before leaving, they subscribed towards a school for Syrian Christian girls, and the nuns promised to hold a special service on their behalf. Some bigots, so Mr Tata said, would have refused to help the work of Christianity, but he regarded 'education and the spread of knowledge under any colouring better than ignorance'. He had always in his heart a warm spot for the young; it amused him to be escorted from the Holy City by a troop of children to whom he distributed baksheesh. Wherever the travellers went, the population turned out to see them. In the more remote villages the inhabitants often lined the road,

providing a voluntary guard of honour. One man, 'a burly looking Mohammedan with a long percussion gun', wished to attach himself to the party. He had some fearsome stories about robbers and robberies, and offered his services as a guard. Not that he could fight the whole band, but he claimed that he was intimate with the chief, who would not molest anyone in his company. When Mr Tata ascertained from his dragoman that the man was romancing, he soon got him away. He told him that they were well fortified against dangerous persons. Their baggage, indeed, 'was chock-full of powder, bullets, and bombs; in fact, it was an infernal machine, which, at a single spark, would explode and destroy a whole country-side, mountains and all'.

At one halting-place a band of reapers, chanting a form of prayer, presented Mr Tata with a sheaf of wheat. Outside his tent was planted the British flag, which sometimes brought inquiries as to the nationality of the travellers. 'In one small village,' writes Jamsetji Tata, 'the people with nature's bounties in abundance about them looked a wretched lot, emaciated and begrimed with dirt, the females, even the young ones, looking like ugly hags. But the beauty of one we saw in the house of the Sheik as we passed made up for the ugliness of the whole lot of them. Two young women came on to the roof of the house to see our cavalcade pass: one was a little over twenty, the other probably seventeen. Both were good-looking, but the latter was surprisingly lovely. As I passed close I made a low salaam; the elder one returned it gracefully, but the younger, like a schoolgirl, taking the end of her veil in her mouth, only tittered and laughed. It would repay the trouble of a visit to Palestine,' he concludes, 'just to obtain such a look as that.' Indeed, Mr Tata thought that even his fellow-traveller might have smiled, had he seen it. The remainder of the journey to Damascus was uneventful save for the continual grumblings of Mr Tata's old companion, but the beauty of the scenery and the vivid colours proved ample compensation for

the behaviour of the 'selfish, egotistical, complaining mortal'. At this stage, unfortunately, Mr Tata's journal comes to an abrupt close, and no record remains of his journey to Russia, or of his experiences in England.

Early in 1874, his mind broadened by travel, he returned for a time to Bombay, and there resumed his various interests. Like his father, he found relief from the cares of business in the social amenities of a club. For many years Mr Nusserwanji had been the most active member of an informal coterie. In the sixties and seventies it was the custom of the well-to-do Parsees to form these small circles under the leadership of one or two prominent men. After business hours they would gather together to enjoy the pleasures of conversation, or to indulge in quiet amusements, such as chowpat, cards, or chess.[1] For this purpose they selected a bungalow, with a large garden, situated outside the business portion of the town. As a rule the house was the property of the leading member, and in such a case there was no subscription. A caterer was employed, who went round every morning to call upon those who frequented the circle, and inquire whether they wished to take part in the evening's gathering. There was no particular qualification for membership; men who were deemed agreeable were from time to time admitted to the set, and as the older members fell away the vacancies were made good. Mr Nusserwanji Tata's club, which had its home in one of his bungalows at Chinchpoogly, was kept in existence by fresh relays, but most of the members were men of the old school who had been associated with him in business.

When his son in turn founded a club, he conducted it more upon western lines, and made it attractive to younger men. During his first visit to England, Jamsetji Tata met several young Parsees, who were there in pursuit of business or education. It was their custom to meet at regular intervals. In

[1] Chowpat is a game played, like pachesi, with a special board, dice and pieces.

London, as a rule, they met at the home of Dadabhai Naoroji, who had charge of the Parsee House of Cama. Many of them returned to Bombay about the same time as Mr Jamsetji, and naturally resumed their gatherings. They made a practice of assembling at the Band Stand, or some other open space, for conversation; occasionally they would dine in each other's houses, or at an hotel. By degrees they gathered round them most of the fashionable young Parsees of the city, who wished to acquire the habits and culture of their travelled friends.

One of the most prominent members of this circle was Pherozeshah Mehta, who returned to Bombay in 1868, and had already begun to make a name at the Indian Bar. The friendship, which he formed with Jamsetji Tata on their meeting in England, soon ripened into an intimacy which lasted throughout life. The two conceived the idea of inviting all the younger men of their particular set to form a club with a permanent home, and thus the Elphinstone came into being. In the early seventies it was housed in Victoria Buildings, on the third floor of the offices belonging to the firm of Tata. There the club remained for many years, but later the members migrated from place to place, and in the course of these migrations the Elphinstone lost much of its original character. At the outset the more conservative Parsees looked somewhat askance on the little band of reformers who sought to model their club life upon English lines, but by degrees the older school found that the contact with younger men and new ideas enabled them to rub off the rust which had hitherto corroded their minds.

As Mr Nusserwanji and his cronies grew older and less active, they ceased to use their bungalow day by day, and confined their meetings to a weekly dinner, which took place on Sundays. In after years Jamsetji Tata, by paying a part of the rent, endeavoured to keep together the club at Chinchpoogly, for he deplored the loss of the old association, and at

length brought about an amalgamation with the other clubs in which he was interested. Some time after the foundation of the Elphinstone he and Pherozeshah Mehta had joined a second social club, the Excelsior; this had, however, gradually dwindled in numbers, and had been practically absorbed in the Elphinstone, where the members of both clubs partook of the weekly dinner on Wednesday. At Mr Jamsetji's suggestion the remaining members of his father's old society transferred their Sunday meetings to the Elphinstone, when the three clubs were amalgamated and reconstructed. There they were joined by many younger men, who were able to share in the life of a flourishing institution. Mr Tata himself never missed either of the weekly dinners, and always spent his Sunday afternoons at the club. The social side of Bombay owes a debt to the Tata family and to their friend, Sir Pherozeshah, for the idea of founding similar institutions gradually permeated other communities. Clubs devoted to various interests soon became a notable feature of Indian life.

For a time, however, Mr Tata was constrained to leave his social activities in Bombay. He was then preparing for the future. He had two sons to succeed him: the elder, Dorabji, was just fifteen; the second son, Ratanji, was but three years of age.[1] On returning from England, Jamsetji Tata soon left his quiet home in Churchgate Street, and travelled through the cotton-growing districts in order to select a site for the mill which he proposed to build. He was in his thirty-fifth year. He was of medium height, and inclined to stoutness, but he had a peculiar dignity, and his deliberate movements were those of the self-possessed man of action. The full lips were partially concealed by a luxuriant moustache, though during his earlier years Mr Jamsetji followed the fashion of the moment, and, at one time, grew side-whiskers which gave him the appearance of

[1] The sons were born respectively in 1859 and 1871. The second child, a daughter, died in 1871, aged ten.

a country squire. His face was well modelled; under his regular eyebrows lay deep-set and striking eyes, with that far-away look which denoted imagination in a man who could convert his wealth of ideas into a lucrative proposition. Though his friends knew that he was taking the first step towards success, his name had not hitherto been associated with any remarkable undertaking. The difficulties and trials attending a new venture soon brought out those latent qualities with which he was endowed.

CHAPTER II

THE EMPRESS MILLS

AFTER six years of preparation Mr Tata was ready to devote the bulk of his capital to a trade in which some members of his own community had amassed considerable wealth. In 1851 Mr Cowasji Nanabhoy Davar established the first cotton mill in Bombay; some twenty years later upwards of a dozen mills were at work, most of which were controlled by Parsees. The number steadily rose. Year by year the industry was expanding, and the transitional period provided ample scope for a man who was eager that his country should increase her industrial prosperity by adopting the most modern methods of manufacture.

Unlike her European rivals, India possessed the raw material, but she lacked the necessary enterprise to develop this advantage. Her industries had scarce emerged from the medieval stage, and her cotton culture was conducted on primitive lines. For upwards of two thousand years the plant which ran wild in field and jungle had furnished the inhabitants with their clothing. In addition to the ordinary cloth for daily wear, woven by hand, and sold in the consumers' district, a few centres were renowned for the delicacy of their fabrics, and the beauty of their dyes, which adorned the dress of the wealthier classes. During the eighteenth century, the East India merchant who bought muslin in Dacca, or silk in Murshedabad, and carried home consignments of resplendent robes and rich shawls, found that he could dispose of his wares more readily than could a rival who dealt in the calicoes and lawns of Glasgow and Paisley; but while the finer goods, designed to enhance the colour and luxury of the East, obtained a ready market outside India,

the coarser goods were supplemented or supplanted by material from abroad. The primitive hand-loom attempted to cope with the needs of the people, but failed to do so. Year by year the import of machine-made fabric delayed the prospect of developing the cotton trade, for manufacture on an extensive scale was yet to come.

By slow degrees India arrived at the first stage of an industrial revolution, and half-way through the nineteenth century Bombay could boast of a small array of factory chimneys, which gave her the air of an industrial town. When Mr Tata entered the field, there were fifteen mills in Bombay, containing 462,151 spindles, but the majority of the mills had not then attained a high standard of efficiency. The machinery was old-fashioned, the buildings were frequently ill-adapted for their work: there was little ventilation, and none but the most primitive protection against the hazard of fire. Though labour was cheap, the labourer was casual, unskilful, and untrained, for organization and welfare work received but scanty attention.

Other mill-owners would be the first to admit the part which Mr Tata played in carrying the Indian cotton trade to a higher plane. He set to work when the possibilities of expansion became greater day by day. The opening of the Suez Canal had made his country more accessible. Railways were already creeping across the peninsula, and disturbing the medieval torpor of trade. Mr Tata studied the problem of India as a whole. In a country of deficient rainfall, the people had hitherto been content to depend upon agriculture for their existence, and they were learning to look to the foreigner for their manufactured goods. The conditions of life confined an inhabitant to his own village, where his modest needs could be more easily met. Caste also played its cramping part. A 'factory population', of the type available in European countries, was practically non-existent, for in no particular district could one find a number of operatives trained from their

youth to a particular trade, and dependent upon that trade for their livelihood.

With a clear knowledge of the difficulties which he had to face, Mr Tata began business on his own account. As soon as he had disposed of the Alexandra Mill, he mapped out that prosperous concern which enabled him to lay a stable foundation for the remainder of his enterprises. After his tour in the Middle East, and his visit to England, he settled down to work. A suggestion, made by his father, led him towards an undeveloped district. The manufacturer in Western India was imbued with the idea that Bombay, and Bombay alone, was the proper centre for development, but the city was remote from the districts in which cotton was grown, and Mr Tata decided to locate his mills within easy reach of the raw material, in the neighbourhood of a profitable market, and in an area where supplies of both coal and water were accessible.[1] With patience and thoroughness he journeyed through the likelier parts of the peninsula in order to find a site which would meet his requirements. After careful investigation he fixed upon Jubbulpore, in the extreme north of the Central Provinces. He was attracted thither by the prospect of utilizing hydraulic power in the working of his mills. The falls of the Nerbudda River would have served his purpose. When he had selected the site, he applied to the Government for the necessary concessions, but found that his choice was obstructed by one of those curious impediments which dog the steps of a pioneer who attempts to modernize the East. At the chosen place a fakir had established a small shrine, the sacred resort of pilgrims from the surrounding districts. The fear of a religious riot, if the holy man were evicted, led to an official refusal of the concession. Mr Tata was obliged to turn his steps

[1] When in later years the Nagpur Mill grew in size, neither water nor coal was sufficient for its needs. Coal had to be largely imported from districts outside the Central Provinces, and in 1922 there was fear of a water famine, as the reservoir from which the mill drew its supplies, and the streamlet that fed it, had run very low owing to the larger supplies drawn for all the extensions.

elsewhere, but the idea of water-power took root in his brain. Twenty years later, when electricity had come into its own, he threw himself with ardour into a scheme for driving the mills of Bombay by combined electric and hydraulic energy.

His methodical mind had prepared an alternative site, and he next surveyed Nagpur, in the Central Provinces, some five hundred miles from Bombay. Here again Mr Tata's requirements were fulfilled. The town was situated in a cotton-growing district; it was the terminus of the Great Indian Peninsula Railway; it was within reach of supplies of coal from the Warora mines, and it was the chief market for many miles round. It was also the centre of a large hand-loom industry, ready for the products of Mr Tata's spinning-sheds. There were, however, many obstacles to overcome. Though hand-spinning and weaving had for long flourished in the district as a cottage industry, and a certain amount of labour was to be had, the local labourer had no experience of organization. The roads were bad, and furnished but a poor surface for those bullock-carts which provided the only means of transport to the neighbouring settlements. When Mr Tata first announced his intention of building a mill in what seemed a remote and backward town, the people of Bombay laughed him to scorn for ignoring the place which they regarded as the 'Cottonopolis' of India. But Jamsetji Tata knew his business. Land in Nagpur was cheap, agricultural produce was abundant, and distribution could easily be facilitated, owing to the central position of the town and the gradual growth of converging railways.

After a lengthy search for a site, Mr Tata purchased, for a comparatively small sum, ten acres from the Rajah of Nagpur. The site was close to the railway station, and to the 'Jumma Talao', a reservoir, excavated in the eighteenth century. The earth taken out had been dumped at the side of the tank, forming a number of mounds which had to be removed. In a

country where unskilled labour was cheap, Mr Tata took the risk of converting the marshy tract into a stable foundation. The soil which his men transferred from the mounds was used to level the whole space. Some people in Nagpur shook their heads at this fantastic operation. A local Marwari banker, who was asked to subscribe for shares, refused to participate in the schemes of a man who, as he said, was putting gold into the ground by spending money upon the filling up of swamps. He lived to vary his phrase; and was fain to confess ' that Mr Tata had not put gold into the ground, but had put in earth, and had taken out gold '.

Those who doubted the wisdom of the new project—and there were many who lived to regret that they had not purchased shares—hardly realized that India had given birth to a future captain of industry. Later in life Jamsetji Tata delegated his work to others, and was content to inspire their efforts, but the mills at Nagpur were the work of his own hands. From the first he took up his residence in the town. In 1874 he began, in conjunction with his father and a few friends, to promote the Company, which was formed and registered in Bombay, under the title of the ' Central India Spinning, Weaving and Manufacturing Company, Limited '. The original capital, furnished by quite a small number of subscribers, amounted to Rs15,00,000 in 3,000 shares of Rs500 each. Mr Tata's remuneration as Managing Director was fixed at Rs6,000 a year. It was but a meagre sum when one remembers that he had to keep up a second house and to travel to and fro between Nagpur and Bombay.[1] When he finally gave up his residence near the mills, he reduced his salary to

[1] It was the universal custom of ' agents ' to charge a commission on out-turn by way of remuneration for their work. For years Mr Tata opposed this system and himself never charged a commission. But later, when his firm acted as agents for the Svadeshi Company, he introduced a system of commission of 10 per cent on profits. Subsequently, in order to finance the Institute of Science he suggested a commission of 5 per cent on the profits of the Nagpur Mills.

Rs2,000 for the benefit of the shareholders. They, indeed, had cause to be grateful. He brought to bear upon the new enterprise his practical knowledge, which was the result, not only of careful observation, but of the experience gained at the Alexandra Mill. Early and late, with untiring energy, he supervised builders, inspected machines, tested material, or checked returns. He embarked on his enterprise with courage and conviction. He was a pioneer, not only in his choice of a new locality, not only in founding the first joint-stock company in that part of India, but in his efforts to build up an organization which, as far as his firm and his country were concerned, ultimately proved a model to his successors and to his fellow mill-owners.

For several years Mr Tata remained at Nagpur, and gave the whole of his time to the solution of those problems which face the man who sets out to build a mill on a marsh. His keen eye for the discovery of efficient helpers soon gave him an excellent right-hand man. He told his friends that he was on the look-out for someone, with common-sense, honesty, and intelligence, whom he could train according to his own ideas. Among those who attracted his attention was a young Parsee, Bezonji Dadabhai Mehta, a Goods Superintendent on the Great Indian Peninsula Railway.[1] Though Mr Bezonji knew nothing of the cotton industry, he had considerable experience in organization, and possessed those qualities of character which appealed to the elder man. In 1876 Mr Tata took him into his employment, and, after two years' training, installed him as manager of the new Company. Some time later he was equally astute in his choice of an expert, Mr James Brooksby, an Englishman who combined abundant energy with the requisite technical knowledge. Both these men speedily justified their selection, and Mr Tata was the first to admit how much his new venture owed to their ability and care.

[1] In 1911 Sir Bezonji Dadabhai Mehta was knighted at Nagpur by the King-Emperor.

On 1 January 1877, the day on which Queen Victoria was formally proclaimed as Empress of India, the mills were opened, and in order to associate his enterprise with this notable occasion, Mr Tata named his factory the Empress Mills. They were equipped with 15,552 throstles, 14,400 mule spindles, and 450 looms. The motive power was derived from a pair of compound engines capable of developing 800 i.h.p. The long low buildings which skirt the Jumma Talao were, from the outset, rendered capable of expansion. Their success has tended to obliterate all recollection of the difficult days which attend the launching of a new venture. Mr Tata spent many anxious months before he could work the mills to his entire satisfaction. Unfortunately, during his visit to England, he had been tempted to purchase an inferior class of machinery, selected with a view to conserving the capital of the new Company. He soon discovered his mistake. The quality of the yarn and the amount of the production were poor. The shares began to fall in the market and went down to half their nominal value. Without more ado, Mr Tata set out to redeem his error, for a fire which devastated the loom shed compelled him to renew some of his weaving equipment.

In 1878 he was again in Europe. He spent a few days at the Paris Exhibition, and then, during a visit to England, he purchased a large amount of new plant. The instructions to his agent were revised. During his ownership of the Alexandra Mill, Mr Tata had employed a young Englishman, Jeremiah Lyon, to buy his machinery, and the two established a business connexion which outlasted the lives of both. Each regarded the other with the greatest respect.[1] As a rule, Mr Lyon accompanied his employer to Lancashire, where they decided upon their purchases. This time Mr Tata made no mistake. He sacrificed economy in capital outlay to secure more efficient machinery. His policy was soon justified. In 1881 a dividend of 16 per cent was paid to the shareholders. As the mills began to earn money,

[1] Mr Tata and Mr Lyon died in the same year, 1904.

a due proportion of the profit was set aside for depreciation. By degrees all the shops were refitted, and the cheaper machinery was relentlessly scrapped. He established a tradition, which his successors have preserved. The large amounts written off year by year for repairs and renewals have been more than justified by the excellence of the plant, and the consequent improvement of the production both in quality and quantity.

To ignore the difficulties of the initial stages would be to do Mr Tata a grave injustice. His personal supervision alone solved many a problem. He took heed of his errors, and obtained invaluable experience by traversing the whole maze of the cotton industry. He employed experts who carefully watched the machines, tested their output, and searched for improvements. He looked at his business as a whole. Year by year he planned new extensions. He planted gins and presses for the raw material within easy reach of Nagpur. Hampered at the outset by workmen of poor calibre, restless, casual, and inefficient, Mr Tata made a careful study of the labour problem, maturing, by steady stages, a scheme for the welfare of the workers. From the first moment his aim was to establish a model mill, and at length, by care, labour, and thought, he succeeded.

On the mechanical side he attained a rapid success by introducing an invention destined to revolutionize the whole industry. His expert, Mr Brooksby, while home on leave, saw some experiments with the ring spindle. He was so impressed with its possibilities that in 1883 he sent two short, sample ring-frames for coarser counts, made by Messrs Brooks and Doxey, to the Empress Mills for an exhaustive trial, extending over two or three years, under his own supervision. So immediate were the returns attending the experiments, that Mr Tata at once ordered some long frames to be sent out from Manchester. With the new machinery came an expert fitter from the makers, Mr Robert Roscoe,

who proved a further acquisition to the Company. He was continually making improvements, and the ring-spinning produced such excellent results that the output of the mills was nearly doubled. Within a few years the old-fashioned mules and throstles were gradually replaced by the new type of frame.

This important development was a great testimony to Mr Tata's insight. His readiness to give an immediate trial to any new machinery quickly placed him at an advantage. In America, where the spindle was invented, the trials had not given sufficiently successful results to justify an extensive use of the machine. While experiments in Lancashire were still at a tentative stage, and nothing had been done upon a large scale, two frames at the Empress Mills were in daily use. For Mr Tata persevered, and insisted that the machines should be run to their full capacity. The normal speed of 6000 revolutions was soon exceeded; at the Empress Mills 9,500 revolutions was considered a fair average, but 12,000 revolutions were frequently attained. This high speed was at times hampered by the deficiencies of the 'traveller', a tiny bit of steel which takes the yarn round the ring. Mr Brooksby and Mr Roscoe made great efforts to remedy this defect; they tried various experiments; they altered the shape, and sought a more durable metal for the construction of the part. Meanwhile, Mr Tata seconded their efforts, sparing no expense. Several experiments were made, which ultimately proved such a success, that their invention was generally adopted. On account of this improvement the output of the machines was so satisfactory that Mr Tata scrapped every other type. At first his statistical results were received with incredulity, even by the best English firms, and he had great difficulty in persuading Messrs Platt Bros, of Oldham, to take up the manufacture of the necessary plant. Their conservatism was at length broken down, and in later years they supplied Mr Tata with several ring frames. Though the mule is still considered the best spindle for the finest counts, the throstle

has been entirely supplanted by the ring frame, especially for spinning the coarser counts of cotton.[1]

It was an easy task for a pioneer of sufficient courage to introduce new machinery, but Mr Tata found that in order to obtain the proper results he had also to educate his men. Successful as the Empress Mills became, their efficiency was at first somewhat hampered by the labour problem. The majority of the workmen were casual in their efforts and irregular in their attendance. Even now the average number of absentees varies daily from 15 to 20 per cent. The marriage season causes, each year, a break in the work, and an operative frequently takes a couple of days' holiday, or will go away to a distant home in the country for months at a time. When he is tired of the factory bell he seeks lighter and less regular occupation. On an average the population of the Empress changes entirely every eighteen months. The men do not, however, permanently leave the factory. After a change of scene they drift back and take another turn at the mills, until their nomadic instinct again overcomes their desire for regular employment. As the demand for labour exceeds the supply, an ex-employee, especially if he is a skilled artisan, can be sure of work.[2] Any diversion, such as a procession, or a feast-day, of which there are some sixty in the year, will always deplete the mill, and send the hands to stand idle in the market-place. When the Company endeavoured to house their employees in decent quarters, and leased a plot of land for the purpose, they were forced to abandon the scheme, for the men preferred to reside in their own huts and to choose their own localities. They reverted to a primitive social order, joining their companions of the same caste, or living with their relatives and friends.

[1] With throstles it was found that no counts above 24's could be spun. On the ring frame, with Indian cotton, the Empress Mills spin up to 44's. Once, for exhibition purposes, 80's and 100's were spun, with the use of imported long-staple cotton.

[2] *Report of the Indian Industrial Commission* (1918), vol. ii.

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Though hampered by such unpromising material with which to work, Mr Tata persevered in his attempts to teach his men the value of regular labour, and to improve the conditions of factory life. The Empress Mills were the first in India where proper care was given to ventilation, and in which apparatus for humidifying the air was installed. The arrangements received the approbation of the Home Office Committee on Humidification and Ventilation. Every possible precaution was taken against the devastations of fire. Automatic sprinklers were distributed throughout, and the workpeople were instructed to respect these provisions for their own safety.[1]

The care shown for the operative inside the factory was supplemented by schemes elaborated for his general welfare. Mr Tata realized that men became more attached to a firm when encouraged to associate their interests with those of their employer, and he thought out various methods for promoting their loyalty. One of the annual ceremonies at the Empress is the distribution of prizes. On an average nearly a thousand workers, dressed in holiday attire, are now called up to the platform to receive with undisguised and ingenuous pleasure, prizes of gold and silver watches, chains and armlets, bundles of cloth, or medals for regular attendance, good conduct, and good work. This simple device, carried out upon a generous scale, creates a spirit of rivalry, which helps to ensure better attendance and to increase the dexterity and efficiency of the operatives. A provident fund scheme, and a gratuitous pension fund, the first of its kind in any Indian mill, were gradually built up. These funds provide for the disabled, and furnish gratuities to the family of those who die in harness. A long period of service ensures a comfortable old age. Both officers and employees can, at their option, contribute to the provident fund. On these sums the

[1] Exhaust fans were introduced at an early stage. Humidifying was first introduced by the Empress Mills, for the air at Nagpur is drier than that at Bombay.

Directors pay interest, and add certain increments. Servants of twenty years' standing now receive an addition to their monthly earnings.

Mr Tata's interest in his workmen was extended to the staff. In order to ensure a succession of subordinates fitted to carry on the work, he established a system of apprenticeship, which enables an energetic youth to rise, step by step, in the service of the firm. They who join are well cared for. They have their own quarters, close to those of the staff, provided with billiards-, recreation- and reading-rooms. Amid congenial surroundings a youth who has some education, and can take advantage of his opportunities, has a great chance of success. He is bound for five years, and is allowed a small salary, whereas in other mills he pays a bonus before working. He is thus enabled to learn the practical work from the commencement. At the end of his probation the Company provides him with a post in the department for which he has shown the greatest aptitude. Graduates of a university are trained for the higher positions, and receive a higher stipend. So successful has the scheme proved, that within a few years of its establishment it became exceptional for the head of any branch in the Empress Mills not to have received his training from the Company. A man who has learned his work there need never be idle. Many of the cotton mills in India are now controlled by a manager and by one or two heads of departments who owe their position to the grounding which they received at Nagpur.

The various improvements evolved for the efficiency of production quickly gave to the Empress Mills an almost unique position in the industrial life of India, and the latest extension may justly be called a model mill. Mr Tata was always ready to make experiments for the benefit of the cotton industry. In the firm of Tata 'trade secrets' were almost unknown. If a new process were likely to benefit his fellows, Mr Tata was prepared to furnish full particulars of the results to any inquirer. 'Though ever on the watch to promote the

interests of the Company,' said his colleagues, 'he was not so narrow-minded as to keep the secrets of his success to himself; but freely imparted them to all—rivals, competitors or otherwise—who went to him for information and advice; his principal aim being to raise the industry of his country generally on to a higher and more prosperous plane.' On one occasion the agent of a rival firm, about to open a mill in Nagpur, came to Mr Tata for advice as to the purchase of machinery. So readily was this advice tendered, that the suspicion of the inquirer was aroused, and he bought according to his own fancy, doubtful whether such a powerful competitor could be really disinterested. Mr Tata had said to his friends, in jocular fashion, that if the new mill did not succeed, it would be all the better for him if it contained the proper plant. The jest proved a prediction, for the agent found, in the end, that his distrust was misplaced. In course of time the mill failed, and passed at length into his adviser's hands, who, with Mr Bezonji's assistance, made it the model mill of India.

Jamsetji Tata could well afford to be generous. His pre-vision soon made him a power in the cotton trade; the fruits of his industry were poured into his lap. Year by year the dividends of the Empress increased; the first eighteen reports showed an average profit of close upon 20 per cent, or, with bonus shares, 43 per cent upon the original investments. The founder of such a profitable business could indeed look with pride upon his work. He had increased the prosperity of a whole district. The five tall chimneys which are now reflected in the waters of the Jumma Talao, and the low buildings, which cover many acres of ground, have transformed Nagpur. As the Empress Mills expanded, so did the town. All the adjuncts of a great concern are spread over the property of the Company. There are spinning and weaving, bleaching and dyeing sheds, a ginning and pressing factory, and large warehouses. The extensive premises include residential quarters, and recreation-

and reading-rooms for the staff. Outside Nagpur, in the cotton districts of the Central Provinces and the Berars, are seven ginning and pressing factories with all the necessary appurtenances, and the provision for a growing army of labour. The name of Tata is spread throughout India by agents who purchase the cotton for the Empress Mills from the Punjab to Tinnevelly, or from Bombay to Calcutta, and who sell the products not only in the towns, but in the remoter districts, north, south, east, and west.

Once he could foresee the great possibilities of his venture, Mr Tata, after the first few years of hard work, was content to direct the affairs of the Empress from a modest little office in Bombay, staffed by about half a dozen clerks. He liked the life of the city. He could find relaxation at his club, where he resumed his weekly dinners, talked of his studies or his travels, heard the gossip of the community from his Parsee friends, or chuckled over his successes at chowpat. Those who had ridiculed his migration to the provinces, saw in him a man who had already made his mark. He could leave Nagpur with his mind at ease, for he left behind him a most efficient lieutenant in Mr Bezonji Dadabhai Mehta, who proved a master of his craft. As Mr Tata said of him in later years: 'That so vast a concern as this has grown to be, can be so successfully managed by a Board of Directors and a firm of agents, having their headquarters five hundred miles away, is in itself a sufficient proof of his great merit.'

In 1884 Mr Tata selected two lieutenants from his own family. As soon as the Empress Mills were on the high road to success, he began to think of the continuity of his various interests. He brought into the business his cousin, Mr R. D. Tata, then a man about thirty years of age.[1] He was the son of Mr Dadabhai Tata, who had been adopted by his brother, Sorabji, and had managed

[1] He was always known among his friends as 'R. D.', in order to distinguish him from Mr Jamsetji's second son, 'R. J.', also named Ratanji, after the great-grandfather.

the branch in Hongkong.[1] 'R. D.' was educated at Elphinstone College; then he studied agriculture in Madras, but eventually took over Tata and Co. In the East he displayed great ability for finance, and Mr Jamsetji formed such a high opinion of him, that within five years Ratanji Dadabhai Tata was a partner in the Mills.

At the same time, Mr Jamsetji provided a place for his elder son, Dorabji Jamsetji Tata, who was then twenty-five years of age. As quite a little boy he was his father's constant companion, and had profited by the wide reading and the intellectual conversation which came his way. Enthralled by the fascination of *Tom Brown's Schooldays*, he set his heart upon joining in the life of a public school. Originally Mr Tata intended to send the boy to Rugby, but Nusserwanji Tata interposed, as he thought his grandson too young to go so far from home. 'Very well,' was Mr Jamsetji's reply, 'but you must let me send him when he grows older.' In time he abandoned the idea of a public school, but waited for a few years and sent his son to England in 1875. After two years with a private tutor in Kent, Mr Dorabji went up to Cambridge, and in October, 1877, he matriculated at Gonville and Caius College. There he devoted a portion of his time to various forms of sport, obtaining his college colours for cricket and football. In August 1879, Mr Dorabji Tata returned to India, as his grandfather did not wish him to be any longer away from home. He entered St Xavier's College and took his degree at Bombay in 1882. His father then wanted him to go into business. 'You can't sit idle,' said Mr Tata, and placed his son for two years in the office of the *Bombay Gazette*, where Dorabji Tata learned the ordinary routine of journalism. It was not, however, to be his life's work. In 1884 he was taken into his father's firm to acquire a knowledge of the various branches of the cotton business. Three years later he completed his training.

[1] See p. 13, and Appendix C.

For some time his father had been contemplating an extension to his activities to Pondicherry, a town in whose particular speciality he was prepared to make experiments. He had visited the place, and had seen some mills doing a profitable trade in what is known as 'guineas', a cloth that derived its name from an extensive sale in the French Colonies in Africa, particularly in the Gulf of Guinea. The cloth obtained a high price in the market, and was imported into New Guinea free of duty. Its peculiar attraction to the native along the coast lay in a special shade of indigo dye, due either to the water of Pondicherry, drawn from artesian wells, or to some secret process involving the use of a certain ingredient known only to the dyer. It was even said that the dye possessed a particular smell, by which those who dealt in the material could be certain of its origin. Most of the stuff designed to take this shade of blue was manufactured in Pondicherry. At one time the French Government had endeavoured to transplant the whole dyeing industry to their own country, and had tried to tempt an expert from India to exercise his art in France, but it was found impossible to produce the delicate shade under other conditions, and the French continued to nurse the industry in the town of its origin, allowing the cloth, dyed and undyed, to pass their customs free of duty.

Mr Tata was always impatient over a burden placed upon Indian manufactures, and he felt that this fiscal advantage was sufficient to warrant a new enterprise. He decided to open a mill at Pondicherry for the manufacture of the cloth, first sending an expert to obtain samples of the type of goods used in the French markets. He made some similar cloth at the Empress, and sent the material to be dyed in Pondicherry. He was on the whole satisfied with the results, and found a market for his material in the French Colonies, though he was unable to avoid a certain proportion of the duties.[1]

[1] In 1899 Mr Jamsetji Tata visited Mahe (see Chapter VI), where he contemplated the erection of a cotton mill. He prepared a

After careful consideration he began to frame his plans for this new expansion of the Tata business, and asked his elder son to investigate the possibilities of the scheme, and to take charge of his interests. 'Come,' said he, 'you have made your experiment in the *Gazette* office, and been there long enough. There is no work for you in our office, and I do not like you to come and take a chair there, just as the master's son. I want your help. It is time for you to go in for the serious things of life. I will send you to Pondicherry to investigate and go into the question. You must go to the Government and apply for a site and make inquiries about Indian labour.'

Dorabji Tata readily acceded to his father's wish, and thus began his first important connexion with the firm, but the work at Pondicherry did not last long. He quickly sent in a report which dealt with the supplies of cotton and fuel, the acquisition of land, and the conditions of labour. Then he obtained the Government's sanction to build a mill, and prepared to settle down. He rented an excellent house, but no sooner had he moved into his new home, and collected a staff of servants, than his father abandoned the project, and recalled him to Bombay. The increasing activities of the firm had convinced Mr Tata that he would soon need more assistance, and he sent his son to the Empress Mills, where Dorabji learned the cotton business from Bezonji Dadabhai Mehta. He remained there for a year and a half, rapidly acquiring a practical knowledge of the work. During his stay in Nagpur it was found necessary to open a ginning factory in the Berars, and Mr R. D. Tata was deputed to go to Nagpur, make a tour of the district with Mr Dorabji, and select a suitable site. 'R. D.'

memorandum on French colonial trade for submission to the French Minister of the Colonies, and was promised an introduction to the President of the Republic, but the matter seems to have ended before Mr Tata took any definite steps. He had a lengthy correspondence with the Messageries Maritimes Co. as to their steamers calling at Mahe, for he wished, in order to reduce the duties, to transport cotton under the French flag.

fixed upon Yeotmal and then returned to Bombay, while Dorabji was left in charge to gain experience of what, to him, was a new branch of the trade. Within a few months he too was recalled, for in 1887 Mr Tata converted his business into a Company, under the name of Tata and Sons, and took into partnership his cousin, R. D., and his elder son. The younger son, Ratanji Tata, who was then but a youth, joined the firm later. Mr Nusserwanji, who passed his declining years in the country house at Navsari, died there before the firm of Tata and Sons was constituted.[1]

By that time Mr Jamsetji had extended his interests in the cotton trade, and the Empress Mills had ceased to be his sole care. They were fast becoming the most important factory of their kind in the whole of India. They began life with a capital of 15 lakhs, divided into 3,000 shares of 500 rupees each. In ten years they were paying a dividend of 20 per cent. Between 1886 and 1899 the capital was twice increased, and the profits were so great that every shareholder received a number of bonus shares proportionate to his holding. At the time of Mr Tata's death the shareholders found themselves in the possession of a lucrative investment, and they continued to do so when the business passed into the hands of his successors. Thirty years from the opening of the Empress Mills, Rs31,87,500 had been added to the capital, which in 1907 amounted to Rs46,87,500. The dividends paid up to that date totalled over 18 million rupees (Rs1,81,10,631), and the earnings exceeded thirteen times the original capital. A Rs500 share was worth Rs5,718, and, in addition, had brought the fortunate owner Rs5,488 in dividends. In 1912 a further 50 lakhs was raised by the issue of 10,000 cumulative preference shares at 5 per cent. Original holders were in the happy possession of shares worth Rs7,015, which they had bought at Rs500, and in addition they had received, as a bonus, one share and a quarter. The five separate Mills then contained 2,200 looms,

[1] He died at Navsari, 29 January 1886.

100,354 spindles, and bleaching, dyeing, and finishing machines of the most efficient type. Up to June 1920, the total profits of the Empress reached the stupendous figure of seven and a half crores of rupees, nearly fifty times the original capital, and, for that year, the dividend was 160 per cent.

The scale of the profits exhibits Mr Tata in the light of a great pioneer of the cotton industry. It was his ambition that the Empress should pay a dividend of 100 per cent. Though this sum was not reached until after his death, the fact that it was at length attained is sufficient to show how successfully the firm has carried on the tradition of its founder. These welcome results were due to the liberal and far-seeing management. Continual improvements have been made. By degrees the whole of the original machinery has been replaced by the most modern plant. A large reserve fund was built up, and every year an adequate sum, which was set aside for depreciation, enabled the best and the newest machinery to be put in. During the past six years the success of the Empress Mills has been continuous, for the profits have been sufficient to justify an average dividend of over 90 per cent. There have been, of course, relatively bad years, but the returns are remarkable. In 1919 the dividends on each ordinary share of Rs500 were Rs350; in 1920 they increased to Rs800. In 1921 they fell to Rs450, but in 1922 they rose again to Rs525, though the mills were working under great difficulties, for there was a shortage of water in the Jumma tank, and the dyeing and bleaching departments practically ceased work. In 1923, despite depression in the textile trade and the trouble of strikes, the dividend paid amounted to Rs280 on each ordinary share. The original holders who had received bonus shares upon which the same dividends were paid, could, in 1920, reckon their actual dividend to be 360 per cent.

A review of such profits, sufficient to rouse the envy of any investor, carries one forward to a time when the Empress Mills are approaching their Jubilee year, and

far beyond the lifetime of Jamsetji Tata. But they serve to illustrate how well he laid the foundations of the business from which he derived most of his fortune. The Empress was the work of his own hands. He was always proud to show anyone round the Mills. He was pleased with admiration of his methods or machinery, and 'especially', said a visitor, 'with my remarks on the cheerful and healthy air of content I had seen in the work-people'.[1] After he had been in the cotton trade for a quarter of a century, he at length alluded modestly to the secret of his success. On 5 July 1901, he presided at the opening of a new spinning-shed at Nagpur, when he addressed his audience with the quiet confidence of a man who knows his own power, and is justly proud of his achievements. He spoke in no boastful spirit, but as one who endeavours to stimulate in others an effort equal to his own. 'We have continued to enjoy prosperity,' said he, 'even with adverse times to fight against. Our relations with all concerned are the most friendly. We have maintained the same character for straightforward dealing with our constituents and customers. Our productions have continued to be of the same high quality, and therefore command the best reputation and realize the highest prices.' After giving his audience a few brief details of the manner in which the Company cared for the welfare of the workers, Mr Tata added: 'I mention these facts only to point out that with honest and straight-forward business principles, close and careful attention to details, and ability to take advantage of favourable opportunities and circumstances, there is a scope for success.'[2] He said nothing of himself, for it was part and parcel of his nature that he should ignore his own share in the work. In a report of the Empress, issued after his death, his fellow Directors said of him: 'He never alluded to his own self-devotion, and even self-abnegation, which he exercised on all

[1] Mr J. E. O'Conor.

[2] Speech at the opening of a new shed at the Empress Mills, 5 July 1901.

occasions in its interests. He was never influenced by family or friendly recommendations, and did not choose any employees unless he was satisfied that they would lead to the Company's advantage. He accepted only a nominal remuneration for his extraordinary personal services, thus giving practical proof of his zeal for the welfare of the shareholders.'[1]

Since Mr Jamsetji's death, the mills which he founded have prospered even more than in his lifetime. No one did more to preserve the high standard of the firm than did Mr Bezonji Dadabhai Mehta. In his own line he proved himself to be a genius. On all sides he is recognized as a really great manager, to whom abundant credit should be given. Not only did he control the Empress, but he was constantly at Mr Jamsetji Tata's side throughout the difficult period which marked the launching of the Svadeshi and the Advance Mills. Between the two men relations were never strained. Mr Tata's confidence in his lieutenant was so great that Mr Bezonji could always approach his chief without the least hesitation or reserve.[2] Both acquired an intimate knowledge of the common worker and could treat him with sympathy and understanding. At Mr Tata's death his colleague continued as Manager at Nagpur, although the son offered him a directorship, which he declined. In 1911 he was the recipient of a knighthood, and everyone in Nagpur was proud of the honour bestowed upon him by the King-Emperor, who said to him at once, 'I know you have splendid mills here'.

The words were not an empty compliment, for, though other mills in India have now reached an equally high standard of efficiency and organization, there are no factories in India which are better managed. No. 5, which began life as the ill-starred enterprise of a disbelieving agent, is justly considered a model mill. Above all, the workers are well cared for and responsive. As

[1] Report of the Directors of the Central India Spinning and Weaving Co., 1904.

[2] Mr Bezonji Dadabhai to Mr D. J. Tata, 20 May 1904.

the founder once said: 'Employment in the Empress Mills itself connotes a sense of good behaviour'. From the time of opening his venture at Nagpur, Jamsetji Tata took an active interest in the well-being of the employee, and the work has been elaborated by his successors. Each year the Company sustains a loss by providing the necessaries of life, such as cloth, rice, wheat, and oil, on credit, and at less than cost price. During five years (1918-22) the loss on each employee ranged from Rs11 to Rs65; and in 1922 the total deficit on 8,419 operatives was Rs2,41,720.[1] Medical help is given free of charge to workers and their relatives, at the average rate of 217 a day, and at a cost of Rs40,000 yearly. There are two crêches for the babies of the women employed, and primary classes for the little boys who bring a meal to their mothers. The girls who work half-time are able to attend classes in reading, writing, and needlework, and for the older children there are two Factory Schools, to which the Directors contribute a portion of the funds. The Mills also make an annual contribution towards the local schools. As well as the children, the aged and infirm have their privileges. Thrift is encouraged. A Gratuitous Pension Fund and a Provident Fund are subsidized by the Directors. They also founded a Co-operative Credit Society with a loan of Rs50,000. A subscription of 4,745 shares of Rs10 each was a good beginning, and within the first nine months the Society could show a profit of close on Rs2,000. For the women there is a Maternity Benefit Allowance, and every employee has the advantage of a Compensation Fund for accidents.

While the workers at the Empress can thus take advantage of many material benefits, they have also the opportunity of exercising or resting mind and body. Seven night-schools are now at work, where languages are taught, and, in some centres, music and dancing. Once a week there is a popular lecture, frequently

[1] A full statement of the figures is given in a pamphlet, *Annual Report for* 1922 *of the Empress Mills Welfare Work, Nagpur*.

illustrated by lantern slides. Much of this evening education is conducted under an arrangement between the Directors and the Y.M.C.A., whose members have considerable experience of such work. Classes are provided for women and girls, who are taught elementary subjects, and are encouraged, by the provision of large mirrors, combs, and washing facilities, to come clean and tidy to the class. Each school has its weekly entertainment; concerts, magic-lantern shows, recitations and music by the children, or, at times, a travelling magician. The older people can attend the Institutes, where they are provided with newspapers, books, and indoor games. In the compound of No. 3 there is a cinematograph, which in the course of the past year provided entertainment for 72,000 people. Sports are made a part of civic life. Four gymnasia give ample opportunity for men and boys to engage in various exercises; they have wrestling contests in the open air, and on the summer evenings they can play football, bowls, tennis and various Indian games. Excursions, baby shows and picnics supply amusement and education for the women and girls. In Health Week there are processions, when several of the men are dressed up to represent dangerous diseases, or the animals by which such diseases are carried.

In every direction the Empress Mills continue to expand. Wherever Mr Jamsetji established a business, he thought not only of his profits, but of the welfare of the people, inside and outside the factory. Above all he was keen upon education, and it was only fitting that his name should be handed down to future generations of those who dwell in Nagpur. In 1921 the Directors of the Empress gave Rs20,000 towards building the 'Jamsetji Tata' Girls' High School, and a further grant towards its maintenance. His elder son, as chairman, contributed Rs40,000 towards the initial expense, and the firm of Tata Sons capitalized a sum sufficient to add Rs3,690 to the annual income. It has been said of Mr Tata that he 'did more for India's material

regeneration than any other Indian of modern times'.[1] He began his work at Nagpur. It was work sufficient for any one man, and were his life story to end there, it would still be worth the telling, but he had then only taken the first step in a long and honourable career.[2]

[1] Lovat Fraser, *India under Curzon and After*.

[2] Since this paragraph was printed the following notice has appeared in the press: 'Messrs Tata and Sons have, on behalf of the Empress, Svadeshi and Ahmedabad Advance Mills, made a munificent donation of one lakh of rupees for the Nagpur University buildings. The Executive Council of the University has gratefully accepted it, and has decided to call the building after the late Mr Jamshedji Tata, the pioneer of industries in the country and the greatest industrialist of India.'

CHAPTER III

THE SVADESHI AND ADVANCE MILLS

1886

THE success of the Empress Mills soon encouraged Mr Tata to undertake a kindred enterprise to which he gave a national significance. The Svadeshi Movement, 'India for the Indians', showed signs of progress. To some the term was little but a political shibboleth, to others it was an expression of patriotism. Those who were bent upon the advancement of the country realized that a revival of indigenous industries would prove more serviceable than agitation. Both Germany and Japan were building up their national life upon the stable foundations of trade, and it was felt by many that India would do well to follow their example. Mr Tata was in sympathy with the Congress party, which was then in a temperate mood. Though he did not take an ostentatious part in politics, he decided to associate his firm with the development of a true Svadeshi movement. To him the industrial advance of India was to be the vindication of her growing aspirations, and of her demand for constitutional self-government.

Hitherto the staple work of the Indian mills had been the weaving of those coarser cloths in which the Indian was clothed, or the spinning of lower counts of yarn for the Chinese market. Materials of a superior texture were nearly all imported. After due consideration, Mr Tata decided to compete with the British manufacturer, by spinning a finer yarn and weaving finer materials from Indian cotton. With these objects in view, he founded the 'Svadeshi Mills Company, Limited'. The capital was fixed at Rs10 lakhs (£66,660), with power to increase it to Rs15 lakhs. The Company was registered on 13 September 1886, and within a year a projected expansion

necessitated a further increase of capital to Rs20 lakhs, of which Rs15 lakhs were paid up. A suitable site for the new mill was purchased at Chinchpoogly, but no sooner were the plans put in hand, than Mr Tata decided upon a course which none but the most confident would have adopted.

Early in the following year, when the Company was preparing to buy its machinery, one of the oldest factories in India was put up for sale. Founded in 1860, the Dharamsi Mill was situated at Kurla, nine miles outside Bombay. For twenty-seven years it had maintained a precarious existence; it had been no fewer than four times in liquidation; it had destroyed the reputation of several successive agents; and, among the superstitious, this ill-starred structure was regarded with fear and suspicion. But the success of the Empress had given Mr Tata justifiable confidence in his own power. He considered the advantages that might accrue from the purchase of a ready-made mill, which he thought could soon be restored to running order. He prepared to take the chance. Before concluding the bargain, however, he brought down his experts from Nagpur, and set them to make an exhaustive report upon the fittings and machinery. The experts were not unanimously in favour of his project, but he, too, could weigh possibilities. He had asked them to advise, not to decide. A well-built mill, containing 1,300 looms, nearly 100,000 spindles, with one of the largest mule-rooms in the world, was not to be had every day of the year; in addition, the freehold land on which the structure stood was of considerable value. Cautious as he was, Mr Tata had sufficient spirit to take a risk, and his keen eye had realized that, with proper management, the place could be resuscitated. He bought the Dharamsi Mill for just over twelve lakhs of rupees, about one-sixth of the original cost. Within twenty-four hours he could have sold the place, lock, stock and barrel, and made a profit of two lakhs of rupees for himself. He disdained such a transaction, and resold the mill at cost price to the newly-formed

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Svadeshi Company. He then disposed of the original site at Chinchpoogly, much to the advantage of his shareholders.

Without more ado Mr Tata embarked upon the resuscitation of what he jokingly called his 'rotten mill'. He first set out to reform the methods of finance, and in so doing he set an example which other mill-owners could follow, provided they had sufficient courage. The agents in general were bitterly opposed to his attitude for they could always count upon their gains, even if a balance-sheet were disastrous to the shareholders. To Jamsetji Tata the quarter anna paid to these men as a commission on every pound of yarn and cloth, whether the mill was worked at a profit or at a loss, appeared a 'pernicious system'. 'I think it simply iniquitous,' he said, 'to give large sums of money away to men who are not qualified for the work except by a deed of writing which entitles them to draw large commissions.'[1] He would have none of this at the Svadeshi. He at once abolished commissions upon the yarn produced, and substituted a commission of 10 per cent upon the actual profits earned. He regarded the previous failures of the mill as wholly due to bad management; given good management, he was sure that it could be made to pay. But to turn one of the worst mills in Bombay into one of the best was no light task. His friends shook their heads. The shareholders bemoaned the abandoned scheme at Chinchpoogly. Capitalists, who believed that the evil genius of the place was too strong for any one man, held aloof. Mr Tata would have no truck with timidity or superstition. He was convinced that he had obtained a bargain; and, if it were a bad one, he was prepared to make the best of it. His energy was fortified by the knowledge that a few of his friends and assistants had abundant faith in his power to complete the arduous work to which he had set his hand.

If Mr Tata was ever under the impression that he had bought a concern which could speedily be set

[1] *British Indian Commerce*, October 1898.

going, he was as speedily disillusioned. The whole of his energy was needed for the re-creation of a ramshackle mill. He determined, therefore, to do the best he could, and for the sake of his new venture he borrowed for a time from the Empress Mills some of the most efficient of the staff. He, at intervals, brought to Kurla his right-hand man, Mr Bezonji Dadabhai Mehta, as well as his two experts, Mr Brooksby and Mr Roscoe. Tata and Sons became the agents of the Company. Both the younger partners assisted Mr Tata. His cousin, R. D., was made largely responsible for the financial side of the undertaking, and Mr Dorabji Tata was given an opportunity to learn the routine of management.

Had it not been for the assistants whom Mr Tata transferred from Nagpur, his burden would have been far greater. Those who served under him were inspired by the whole-hearted way in which he tackled the work of reconstruction, and they responded nobly. In the early days of the Svadeshi it was of the highest importance that the subordinate staff should be not only efficient, but loyal, sympathetic, and firm. They were called upon to face a position of great difficulty in regard to labour. Many of the workmen had dispersed, and were unwilling to return to a place which was renowned only for successive failures. After much expense and trouble a sufficient number of operatives resumed work, though they proved but an ill-disciplined mob. Under the old management there had been no semblance of order. The men had steadily deteriorated. Chimbur, a neighbouring suburb, was the nest of a gang of gamblers who, by the lure of the dice, reduced their improvident victims to penury. Theft was rampant. Numbers of articles were stolen daily from the open compound. Men came to work for a week, and left again in groups, carrying with them some oddment of the Company's property. Riots and strikes were frequent, and for some months many of the spindles and looms were continually standing idle for want of workers.

The machinery matched the men. The factory had

been planned without any proper regard to sequence or design. The equipment of the blow-room had to be shifted, and was housed in a specially built department. Engines and boilers were of a wasteful type; the shaftings were heavy and straggling, and machines were huddled together on any part of the floor. Those that were retained, possessed but little life, for years of neglect had rendered them almost useless. In place of the steady hum and regular throb of a well-ordered mill, the Svadeshi echoed with the groans and creaks of a makeshift concern. Mr Roscoe, the technical spinning expert of the Empress, had a most tedious task. Each individual machine needed to be put into order. More than 200 looms and 40,000 spindles were thrown aside as useless. The others, which were patched up, gave the poorest results. Mr Tata had hoped that the old machinery would earn sufficient profit to pay for the new, but, when work began, he quickly realized that the long neglect had done irreparable harm.

During the first two years the labour problem was a constant source of difficulties and delays. As new mills were established in Bombay, the workers moved from one factory to another, and there was little or no surplus of men. Agents were dispatched to Broach and Surat to collect employees, but despite higher wages and the inducement of free quarters, the batches could not be persuaded to remain in Kurla for any length of time. Mr Tata looked about him. At first he suggested that the Salvation Army should send him some of the wastrels whom they had reclaimed, but such men, as a rule, would have only made an uncertain stopgap. Some more reliable and systematic scheme was needed. In the North-West Provinces, where wages were low, the supply of labour was in excess of the demand. A Commission, which had investigated the causes of a recent famine, was suggesting the migration of workmen to towns where employment was to be obtained. At the Svadeshi Mill it was possible to earn six annas a day, instead

of one anna on the land, but this was not sufficient to tempt the Indian from his own province. Mr Tata, however, addressed a lengthy memorandum to the Lieutenant-Governor at Allahabad. He reviewed the rapid growth of the cotton industry in Bombay, and the increasing output due to the introduction of the newest machinery. He asked the Government to devise some scheme for the steady immigration of operatives to the town. 'Men, women, and young persons,' said he, 'who may be willing to move here under certain guarantees, can be well cared for and protected, till by slow training they are able to earn as much as the Bombay operatives.' It was Mr Tata's view that the favourable reports of the immigrants would induce their friends and relatives to follow their example, so that a continuous stream of workers would find its way to the city. In addition, he requested the Millowners' Association to consider the labour problem, and to formulate a scheme which would make provision against the growing shortage of workers. The Association, however, preferred to leave the matter to adjust itself, and Mr Tata's proposals were put aside.[1]

Despite a shortage of labour, poor machinery, and difficulties of management, the Svadeshi Mills were kept going. Output and reconstruction went on side by side. In 1888 the first consignment of cloth was dispatched. Some bales, of a suitable texture, were sent to Pondicherry to be dyed. Thence they were shipped to Bordeaux, for sale on the North Coast of Africa. But in the markets upon which Mr Tata relied for his greatest expansion, the products of the Svadeshi proved worthless. The first consignments sent to Shanghai were almost unsaleable. Both from China and various parts of India the Company received complaints of the poor quality of the yarn and of the material. At the end of the financial year the Directors announced a deficit of Rs75,000. Gossip about the failure to capture the Chinese market percolated through the bazaars, and when

[1] The letters are printed in Sir D. Wacha's *Life of J. N. Tata.*

the Company failed to pay a dividend, the shares went down to about a quarter of their original value. Though the mill had hardly had the necessary time for a fair trial, the shareholders were disappointed. The reputation which the name of Tata had already earned led them to expect an immediate return for their money. A temporary crisis ensued. Banks and investors became lukewarm and suspicious. Had they been fully aware of the difficulties they would have exercised more patience, and those who sold their shares soon lived to rue the day, for the Svadeshi was controlled by a man who could confound his detractors and put them to a perpetual shame.

At the time of the crisis Mr Tata was in England, where he had gone to seek advice as to his health. It was his custom to pay periodical visits to the Empress Mills, and during one of these visits he was seized with the first of those attacks to which he was subject in a milder form for the rest of his life. He felt faint and dizzy; he had a singing in his ears, and he was compelled to lie down. His son, Dorabji, was with him at the time, and at once sent for a doctor, who revived the patient with some brandy. Though Mr Tata detested all forms of alcohol, he was glad of the relief which it afforded him. When the attack subsided he was immediately taken to Bombay, and thence on to England for further treatment. But after his first seizure at Nagpur he was never quite the same man. Those who had noticed a change in him attributed it to the anxiety of his new venture, and said that he heard the machinery of the Svadeshi buzzing in his ears. He, however, stuck to his last. Still under fifty years of age, he had abundant zest for work; and though the strain gradually told upon him, he preserved sufficient vigour to carry him through the most exacting period of his career.

As soon as his state of health permitted him to travel, he returned to Bombay. The name of Tata and Sons was at stake. Their credit was impaired. Mr Tata at once took the helm, and, by an amazing display of energy

he steered the ship into smoother waters. His first step was to restore the credit of the firm at his own cost. On behalf of his family he had already made those provisions which become the prudent man, and had set aside for his descendants a large sum of money by way of a family trust. When he tried to raise an overdraft on his personal guarantee, a few of the banks refused him any further credit, on the ground that the trust impaired Mr Tata's assets. Adversity stimulated his courage. Without a moment's hesitation he revoked the arrangement, sold some of his shares in the Empress Mills, and liberated the greater part of his capital.

The knowledge of his sacrifice, and the zeal with which he threw himself into the work, restored the confidence of the shareholders and inspired his subordinates to redouble their efforts. Mr Tata again turned to the Empress Mills; brought Bezonji Dadabhai Mehta down to Kurla, and bade him revise the whole policy of the Svadeshi. Mr Bezonji advised on the purchase of the cotton best adapted to the condition of the machinery, and the cloth to be woven on the looms. Mr Roscoe was called in to resume his acquaintance with each individual machine. Mr Tata also strengthened the permanent staff. He appointed a new manager, Mr Dossabhai Mulla, who had been head of the weaving department, after serving his apprenticeship in the Nagpur Mills. Mr Brooksby was transferred to Kurla, and Mr (now Sir) Dinshaw Wacha was called into the firm to assist on the secretarial side of the agency.

Once the mill was restaffed and reorganized, success was not long delayed. Those who watched the work were amazed at the speed with which the alterations and improvements were carried out. The Empress was used as a trial ground for proposed innovations and reforms. Poor machinery was ruthlessly scrapped. New engines and new boilers were introduced. Improvements were made in the spinning-sheds, and ring spindles took the place of the mules and throstles. The buildings were provided with better ventilation, and more light

was admitted. Within two years the mould of the mill was entirely recast. Production reached a level, both in quantity and quality, which, four years after the opening of the Svadeshi, enabled the Company to pay to their loyal shareholders a dividend of Rs45 on each share. The reconstruction was thorough and permanent; the shell of a broken-down mill, stocked with creaking machines, was converted into a light and airy factory, equipped with the most modern improvements. Every detail was modelled on the Empress. Workers, who had formerly been left to take care of themselves, found that the new management took an interest in their welfare. Mr Tata impressed upon all those who served him that the relations between master and man should be regulated with a due regard to mutual interest. He spared no expense, and introduced many appliances not in general use. The risks of disease were lessened by the proper filtration of water. Sanitary huts were provided. Fire extinguishers and automatic sprinklers were freely distributed throughout the sheds. In times of scarcity the operatives could supplement their scanty stock of grain from a depot at, or even below, cost price.

In addition to improving the lot of the workman, Mr Tata improved the opportunities and efficiency of the staff. He introduced his apprenticeship system for graduates, persuading them to increase their knowledge of the cotton industry through the medium of a modern library stocked with books upon the textile trades. Some years later a dispensary was fully equipped, and provident and pension funds were established for the workers on the lines of those at Nagpur.

Under such an efficient regime the Svadeshi gradually attained prosperity. New markets were opened up with varying success, and shipments were sent to many out-of-the-way places with which the Tata firm had long done business. Yarns were sold in Java, Bushire, and Smyrna. An attempt was made to put cloth upon the Egyptian market, but this was at first a failure. Various other markets, such as Aden, Athens, and Malta, were

tried in turn, but the results were unsatisfactory. Further efforts to sell their stuff in Egypt broke down, mainly through the inefficiency of the agents. In Malta the trade for the Indian yarns was hampered by the quarantine regulations. Despite discouragement, Mr Tata realized the possibilities of these markets, and he persevered. During his earlier travels in the Levant he had seen the bales of Italian yarn which were shipped to Alexandria and distributed in Asia Minor. He decided to pit his Indian yarns against the coarser Italian counts. Choosing for his agent an old Indian Mahommedan, whom he had occasionally employed, Mr Tata sent him to Beirut with a sample consignment of ten bales, and gave him three years in which to build up a market. By degrees the Svadeshi yarns became better known. Trade increased. Step by step the firm of Tata and Sons organized and developed their exports upon a more extensive scale. They learned by experience how much they were dependent upon suitable agents, and at length found a firm who could undertake the work to their satisfaction. The reputation for fair dealing which they had obtained led an enterprising Greek to solicit their patronage. After some correspondence the two parties came to terms, and the Svadeshi interests were entrusted to the firm of M. P. Nicolaidi and Co., of Smyrna. Liberal credit enabled the importer to compete with the Austrian and Italian yarns which had hitherto dominated those markets. Within a few years the imports attained a considerable aggregate, and during the European famine of 1906 the products of the Svadeshi Mills were so widely known, that the name of Tata and Sons became a guarantee of excellence even in the remoter villages of the Levant.[1]

After some years of experiment Mr Tata was able to manufacture material upon lines which make him rank as a pioneer in the Indian cotton industry. Owing to the extensive improvements which he had brought

[1] Note by M. P. Nicolaidi and Co. to Messrs Tata, 5 February 1913.

about by his knowledge of machinery and his experience at Nagpur, he at length decided that the Svadeshi was sufficiently well equipped to carry out the spinning of finer counts, the work for which it was acquired. From 1892 onwards the Mill produced 50's and 60's, or even 80's, from Egyptian cotton, and could provide India with a superior class of woven goods which found a ready sale throughout the country. Mr Tata then tried to encourage his countrymen to cultivate the Egyptian long-staple in India. He was ambitious, and justly so, for after the first few years the story of the Svadeshi was one of unbroken prosperity, a sure tribute to the perseverance and ability of the founder. No greater evidence could be given of Mr Jamsetji's success than shares which have risen in value from 500 to nearly 6,000 rupees, and a reserve fund which exceeds the shareholders' paid-up capital of 20 lakhs.

While engaged in the work of rejuvenating his 'rotten mill', Mr Tata took an active interest in a question which affected the trade as a whole. When, in 1894, India levied a duty upon cotton imports, she was compelled by the British Government, in the interests of Lancashire, to impose an excise duty upon her own manufactured cotton. Such discrimination undermined Indian faith in the impartiality of the Raj, and was stigmatized by a prominent English writer as a 'permanent discredit to British rule'.[1] Mr Tata felt it to be so. 'Like all Indians he was a Protectionist,' writes one of his friends, 'and in 1894 he, like many others, was induced to urge the restoration of the Tariff which had been swept away in 1882, the inducement being a sort of assurance, given privately, that an import duty on cotton goods would be imposed without a corresponding excise on local manufactures. The assurance was, of course, invalid, and to his dismay, and high indignation, a countervailing excise was imposed. I had all along been confident that there was nothing in the promise, which he had accepted in good faith,

[1] Sir Valentine Chirol, *Indian Unrest*, p. 277.

and had told him so, warning him not to commit himself to support of the tariff proposals. He came to me in Calcutta, blazing with indignation.'[1]

Though Mr Tata made no immediate protest, he did not allow the subject to escape his attention. He railed against what he called the 'false Imperialism' which only had regard for the Englishman.[2] In his opinion, the profits of the Indian mills, as a whole, were greatly exaggerated. About 1897 he decided to set on foot an inquiry into the profits of the past ten years, which would serve as a guide to those who desired the repeal of the excise. After sending a circular letter to the principal mill-owners, he deputed his disciple, Burjorji Padshah, who assisted him in his educational schemes, to frame and edit a report upon the results. He printed this at his own expense, submitted it to his fellow mill-owners, and then to the general public.[3] The statistics were compiled with great care and patience, involving months of hard work. Naturally there was some controversy over the figures, but on the whole the report proved a vindication of those who contended that the excise duties constituted a serious burden upon the cotton industry. All political questions or tendencies were put aside. 'It is the object of this study,' wrote Mr Padshah, 'not to pass judgement upon the Cotton Duties, but to investigate the general conditions of the Mill Industry, and the effect of the Cotton Duties on its profits.' It was found that the average profits of fifty-eight of the best mills did not exceed 6 per cent, and the omission of the Empress brought the average down to 5 per cent. Mr Padshah arrived at two main conclusions: that the duties could not be defended simply on the ground that they were borne by the consumer; and that the average profits of the industry were about normal, while the profits of the poorer class of factories were much below the normal. A complete abstract

[1] Mr J. E. O'Conor to Mr Lovat Fraser.

[2] See an interview in the *Daily News*, 11 February 1896.

[3] *The Cotton Industry of India and the Cotton Duties* (Bombay, 1902).

of the memorandum would occupy many pages, but, on the whole, it justified Mr Tata's views as to the ill effects of the duty upon the mills of India.

Whatever the average profits of the Indian mills may have been, the profits of Tata and Sons did not seem to suffer by the duties. However sore he felt upon the matter, Mr Tata was too practical to tilt at windmills, and the Svadeshi was still his chief care. Though the success of the concern was due, in the main, to his own efforts, he had imbued his younger partners with an equal amount of zeal. In order to strengthen his hold upon the eastern markets, he entrusted the organization of sales to his cousin, R. D., chief partner in Tata and Co. The supervision at Kurla passed under the control of his elder son. Mr Dorabji was ambitious. Two firms were, at the time, considered respectively the best in Bombay for ordinary and superior yarns for the Far East, but Mr Dorabji determined to outstrip his rivals. He paid particular attention to reeling, and insisted upon rigid accuracy in weights and measures. For China he bought a superior cotton, and rejected the use of any which touched a lower standard. Within three years the products of the Svadeshi were not only obtaining the highest prices in India, but had completely re-established the fame of the firm in the Chinese market.

By 1896 the Svadeshi shares were at a premium; each share of Rs500 had risen in value to Rs750. The early days of trouble seemed to be at an end. Suddenly, however, the terrible calamity of the bubonic plague closed many of the mills in Bombay, but the Svadeshi was one of the few that were kept going. The Christmas of 1896 had seen the usual family gathering at Navsari, with its round of picnics, treats to the children of the Tata schools, and that general air of gaiety which marked the Tata week. When the festivities were at an end, Dorabji Tata, despite the plague, insisted on returning to Bombay. ' If I remain here,' said he, ' what is to become of the office and the mill?' His example had its effect: the staff and the clerks kept to their posts:

the men worked shorter hours, but received more wages. An experiment was tried: the mill was run for sixteen hours with two eight-hour shifts, but owing to the opposition of the hands this was quickly abandoned. At length the continuity of work was assured, and Mr Dorabji was able to spend the week-ends at Matheran, at his father's favourite country house. It was a troublous time. Again the Svadeshi shares went down, but the firm retained its hold upon the markets, and, once the plague had abated, it was not difficult to take advantage of the resumption of trade. During the next few years the dividend on Rs500 varied from Rs35 to Rs65. In 1905 the Directors paid a dividend of Rs152 on each share, and the profits reached Rs5,00,000.

The genesis of the last cotton mill which Mr Tata took over coincided with a change which he made in his manner of investment. He had hitherto placed much of his capital in land, and had frequently overdrawn his banking account for that purpose, so long as his foresight had justified such a step.[1] Suddenly, about 1894, he reversed this policy, paid off his overdrafts, and for the next few years he accumulated funds. He then lent his monies on short mortgages of about three years. Among these mortgages was one for Rs3,00,000 upon the Advance Mills at Ahmedabad, some three hundred miles from Bombay. The name was meant to suggest that the mills were of the most modern and progressive type, but, in reality, the buildings were badly constructed, and the plant, which had been purchased second-hand, was obsolete. In 1898, bad management and a divided policy among the directors, agents, and shareholders had brought the business to the verge of bankruptcy. In order to protect his own interests, and at the same time to save the situation for a defaulting company, Mr Tata foreclosed. His application was resented by the agents, who wished to file a voluntary petition.

After a prolonged dispute, which lasted until 1900,

[1] See Chapter IV, p. 71.

involving various suits and counter-suits, Mr Tata purchased the mills as they stood, for Rs2,03,515. He found that they were in a much worse condition than he had apprehended, but, with his usual energy, he took up the task of alteration and renovation, with a view of either selling the place or converting it into a joint-stock concern. That which he had done for the Svadeshi he did for the Advance. He enlisted the services of some of his best men from Nagpur, and, after considerable labour and expenditure, he succeeded in making the Advance Mills worthy of their name. At first Mr Tata formed a joint-stock company, to take over the mills at cost price, but as he knew that the factory had an evil reputation, he declined to allot any shares to the public. He took up the whole capital himself, though he reserved two-thirds of the shares for certain nominees, and for those who had complete faith in his powers of management. Within a brief space of time the reserved shares were taken up, and in later years, after certain extensions were made, the subsequent issues were so much sought after, that eventually they commanded a premium. The mills were soon valued at more than three times the purchase money, and Mr Tata sold them to the Ahmedabad Advance Mills Ltd for Rs7,12,000.

When, in 1903, the Company was finally formed, the capital consisted of Rs10,00,000, divided into 2,000 shares fully paid up. At first the Advance Mills contained 9,640 spindles and 240 looms; within ten years they were equipped with 20,000 spindles and 294 looms, which have been increased to 30,612 spindles and 600 looms. Mr Tata, however, lived only to see the payment of a single dividend. The profits then amounted to Rs70,050, whereas in less than ten years they exceeded Rs10,00,000, and the dividends increased to such an extent that in 1921 the Directors were able to recommend the payment of 60 per cent. For the past five years the profits of the Advance Mills have averaged Rs280 on each share of Rs500. In 1920 and in 1921 Rs300 were paid: in 1922 each similar share earned a dividend

of 80 per cent. The net profits for the twenty years were Rs1,07,98,900; giving an average profit of Rs110 on every share. Though 1923 was a year of trade depression, the Directors could still recommend a dividend of 50 per cent and carry over a reserve of Rs48,71,646.[1]

During the same period the Svadeshi Mills have yielded returns which are equally striking. In June, 1919, a dividend of Rs175 was paid on each Rs500 share; in December a dividend of Rs425 made up 120 per cent, while seven lakhs were set aside for the renewal of the machinery. In 1920 the half-yearly dividends were Rs250 and Rs350 per share, and a bonus of over Rs1,10,000 was paid to the operatives. The next year, though there was a partial stoppage due to engine trouble, the Directors were able to pay dividends of 110 per cent, out of a profit of Rs36,41,928. The report of 1922 showed a smaller profit, but, even then, the dividend was 80 per cent.

In both the Svadeshi and the Advance Mills the welfare work has been conducted upon the same lines as that at Nagpur. The Svadeshi have their own Savings' Bank and Sick Benefit Fund, a Library, and a Co-operative Society, and arrangements for recreation. There are schools within easy hail. In 1923, welfare work at Ahmedabad was steadily progressing. The employees have their Provident Fund, and free treatment at a dispensary. A Library and Reading Room have recently been erected. Close on 200 of the operatives with their families are housed by the Company, and additional quarters have been built for the apprentices and the staff. Since 1921 a crêche has been opened for the infants of female employees, where a qualified medical man supervises daily the care of some thirty babies. Most of the 200 ' half-timers ' attend a school in the compound of the mill, at which all the paraphernalia of education are supplied without charge.

Such is the progress of the work which Jamsetji Tata

[1] From a memorandum submitted to Messrs Tata by Mr J. A. Divecha.

began. Had he no other title to recognition, his conduct of the mills would suffice. In just over a quarter of a century he rose to the pinnacle of success in the cotton world, and displayed during that time a vast amount of business acumen. His care for sound finance was as valuable to the shareholders as was his insistence upon the most modern machinery. 'It was useless,' wrote his friend, Mr O'Conor, 'to talk to him of an industry in which there seemed to be no profit, and he was quite right, for failures are always discouraging to further effort, irrespective of the money spent. His operations, therefore, and all his experiments were uniformly directed to business which would pay.'[1] He certainly made his mills pay, and pay better than any in India, or indeed than anywhere else. Though Mr Tata spent a certain amount of his wealth on experiments, which were mainly hobbies, his larger operations were always directed towards a sphere of industry in which he saw the prospect of a return to the shareholders. Towards the close of his life he initiated two considerable projects, the Steel Company and the Hydro-Electric Company, but his personal reputation as a captain of industry rests upon the remarkable success of his mills. Through them he built up his own fortune, and the fortunes of others. At Nagpur, Kurla, and Ahmedabad he erected or reconstructed great mills, where he converted casual labourers into a factory population, well cared for and well trained, and taught them to use the most modern machinery. By so doing he made his country more prosperous; he played a notable part in the industrial evolution of India, and assisted her through the transitional stage of her development. Within ten years he had sufficient money to settle down in Bombay, and to embark upon those purchases of property which helped to make him one of her wealthiest, as he was one of her most public-spirited citizens.

[1] Mr J. E. O'Conor to Mr Lovat Fraser.

CHAPTER IV

THE DEVELOPMENT OF BOMBAY

1852–1904

DURING the fifty years in which Mr Tata was associated with Bombay he witnessed the growth of a new city. Each decade, to the end of the nineteenth century, was marked by the erection of some handsome building, the laying-down of some broader thoroughfare, or additions to the docks which make Bombay one of the greatest sea-ports of the world. Outside the actual area of the town, the work of reclamation and of expansion went slowly on. Though some parts of the island were above the level of the sea, others were daily covered by tides which, at their ebb, left stagnant water and vast deposits of mud. As Bombay expanded, portions of the low-lying land were rendered safe by breakwaters, and made passable by causeways. Amid the woods, which covered such heights as Malabar Hill, small residential estates were carved out, and dotted with bungalows. At the close of the nineteenth century the city was furnished with convenient flats, large hotels, a handsome station, and public buildings worthy of the capital of Western India.

Before these changes took place Bombay was somewhat squalid. In 1860 the central part, though picturesque, was far from convenient. Narrow gates hampered the traffic which passed in and out of the congested streets. The Fort, which is now covered with modern buildings, was then an undeveloped tract surrounded by low ramparts. The residential quarter was little but a plague spot, for a population exceeding half a million souls was crowded into mean and insanitary dwellings. There were no bye-laws to regulate building. 'Houses,' says a writer, 'rose to an immense height with only gullies full of filth between them. The roads in places had

become two feet higher than their original level with consolidated filth; drains, where they existed, were generally choked. The Bombay flats were still a foul swamp, the receptacle of every kind of filth, a depository of carcases and offal, to the edge of which crowded the huts of coolies, who lived in a manner so unhealthy that two out of three never survived to return to their homes. The native town in the monsoon became a squalid Venice of sewage canals; and even where the fetid labyrinth of chawls gave place to bungalows with compounds, dunghills and cesspools abounded of which their proprietors had no means of getting rid. Milch cattle were crowded with humanity into dens in which light never penetrated, and the town sweepers left filth of every description lying on the road until it was reduced to a convenient consistency for carting away.'[1]

Such was Bombay as Mr Tata first knew it, but a growing sense of citizenship gradually incited the leading men to put an end to these sordid conditions. Some of the vast wealth acquired during the American Civil War was used for public purposes. Several of the richer citizens, like Premchand Roychand, and families such as the Sassoons and the Jeejeebhoys, left their impress upon the city in which they had acquired their fortunes. 'Though many distinguished Britons,' says Mr Lovat Fraser, 'played a great part in the making of Bombay, and though some among them are entitled to a foremost place in the roll of its famous citizens, the city is, in far greater degree than Calcutta or even Madras, essentially the handiwork of the Indian communities also: Hindus and Mussulmans, and Parsees and Jews, have in equal measure spent themselves and their wealth in the advancement and embellishment of the Gate of India. To their enterprise and generosity, not less than to the prescient control of capable Englishmen, we owe the magnificent capital of Western India as it exists today. If the people of Bombay are imbued with a civic patriotism which I have never seen

[1] *Old and New Bombay* pp. 46, 47 (Bombay, 1911).

excelled anywhere in the Empire, it is due largely to the admirable example set by many members of the Indian communities during the last 150 years.'[1]

Mr Tata's earliest connexion with these schemes of improvement dates from 1863, while he and his father were partnered by Mr Premchand Roychand. When Bombay was charged with the fever of speculation, men cast about for channels in which to invest their newly-acquired wealth, and Mr Premchand launched a company for the reclamation of Back Bay, the western shore of the island. This was one of the soundest schemes launched during that troublous time.[2] The Government had determined to reclaim that area, and, lacking the necessary funds, they decided to assign the concession to a wealthy syndicate, of which Mr Premchand became the moving spirit.

In 1863 the Back Bay Reclamation Company was duly registered. It was considered, at the time, that few projects could be more beneficial to the city. The land on this beautiful sweep of coast, from Colaba Point to Malabar Point, was little but an unsavoury rubbish-heap, frequently under water, and the proposed reclamation would have added greatly to the amenities of Bombay. The concessions made were advantageous to both sides. The Company undertook to reclaim 1,500 acres of land, of which one-fifth was to be handed to the Government. Reclamation was no light task, for skilled labour was scarce, and mechanical appliances were still almost unknown. To raise the necessary capital required for this work the Company issued 2,000 shares of Rs10,000 each. These shares became the most tempting investment in the market, and time after time changed hands at fabulous prices.

Unfortunately for so promising a scheme, Mr Premchand had constituted his Asiatic Corporation the bankers of the Back Bay Reclamation Company. The premium on certain shares, amounting to ninety lakhs of rupees, was lodged with the Asiatic Bank, who advanced the money to all and sundry. When the Bank failed, the shares of the Back Bay Company, which had been eagerly

[1] Preface to *Old and New Bombay*. [2] *Old and New Bombay*, p. 44.

bought at Rs50,000, could be acquired for a fiftieth of that sum. As the shareholders insisted that the Company should be wound up, the Government reaped the benefit of the work already done.

Jamsetji Tata was but indirectly involved in the failure, and he had realized the financial complications in which his father's firm was entangled. Young as he was, he braved his elders, and advised Mr Premchand Roychand to sell some of the various shares, but the older man, impatient of advice, held on. When the crash came, Mr Jamsetji had the irksome task of expounding the complicated affairs of the Asiatic Bank to the London creditors. It was a landmark in his life. He saw how unsound finance could stifle a promising project; but his thoughts were turned to the advantage of reclaiming the swamps which fringed Bombay, and his son, Dorabji, can remember, as a boy, walking with his father round the abandoned works. In later life Mr Tata interested himself in various schemes for reclamation, but in 1868 his fortune was yet to be made.

For over fifteen years he had abundant work in other directions. The Empress Mills bound up his interests with Nagpur, and when the Mills were on the flood-tide of success, the Svadeshi absorbed Mr Tata's time. But as his wealth increased, he turned his attention to the acquisition of property. In 1890 he began those purchases which eventually made him one of the largest landowners in the city, and from that time, until his death, he took a prominent part in the development of Bombay. In all these transactions he displayed particular foresight; there is little that he purchased which has not risen to four or five times its original value.[1]

If it were the custom in India to place a memorial

[1] The extent of Mr Tata's property may be judged by the share set aside for the endowment of the Institute of Research. The property was intended to furnish Rs1,25,000 per annum, but the income has risen. Albert Buildings, Gymkhana Chambers, Victoria Buildings, Albion Place, Alexandra Terrace, Jubilee Buildings (Byculla), Reay House, Sandhurst House, Roosevelt House, Sargent House, Jenkins House, Station Terraces, Candy House, land and bungalows near Jubilee Buildings, land near Albion Place, land in Parel Tank Road.

tablet upon the residence of a notable man, Mr Tata's memorialist would find weeks of employment. For several years the whole family moved about Bombay like a nomadic tribe, and rarely remained in a house for more than a few years. Three generations lived together in the patriarchal fashion of times past. During the prosperous era of the cotton boom they resided in Hornby Road, in the house rebuilt by Nusserwanji Tata, where in 1860 he held a house-warming on the first birthday of his elder grandson. After returning from England in 1868, Mr Jamsetji moved from one part of the city to another, and at length drifted back to the house in the Fort which he and the family had occupied as early as 1859. His father, who could also make a good bargain, had bought some bungalows at Chinchpoogly, which Mr Jamsetji at length took over. Then the son bought a neighbouring house, Bellair, and purchased much of the surrounding property, including some quarries, which, by furnishing good stone for building, became a profitable investment.

His various changes of residence gave to Mr Tata an unrivalled knowledge of the residential possibilities of Bombay and its environs. As the family fortunes increased, father and son decided to build a permanent home befitting their new estate. For the family residence Mr Nusserwanji Tata, on his son's advice, selected a site on the Esplanade, opposite the Gymkhana, and obtained a 999 years' lease, freehold, at a reasonable price. There was no possibility of the house being overlooked, or darkened by adjacent buildings. It was in a central position, and within easy reach of the Office.

Though the foundations were laid in Mr Nusserwanji's life-time, he did not live to see the place, and Mr Jamsetji built Esplanade House as a dwelling fashioned to his own design. While simple in his personal habits, he was not averse to spacious and splendid surroundings. He instructed the architect, Mr Morris, to construct a mansion in the classical style, with a central courtyard, surrounded by corridors, like the 'patios' which Mr

Tata had seen in Spain. The rooms are large, but few in number. A marble staircase lends some splendour to the interior, and the glass roof of the courtyard was a novel feature in Bombay. The whole house was furnished in European fashion. Catholicity of taste might have led Mr Tata into strange lapses: he was impatient of contradiction, but at times his son Dorabji could persuade him to modify his ideas. He, however, knew what he wanted. He had to house a collection of curios, and all the odds and ends which he accumulated during his travels, but his chief pleasure lay in a well-stocked library, where learned volumes shared the shelves with works of fiction.

Outside the city Mr Tata's favourite haunt was a bungalow at Matheran, some fifty miles from Bombay. In the early nineteenth century the Collector of the District, wishing for a retreat during the hot season, and fascinated by the magnificent view, had pitched his camp upon a knoll on Matheran Hill, where he staked out a claim and built a bungalow. In course of time the Castle Hill property passed into the hands of Mr Premchand Roychand. During the prosperous days of the cotton boom Mr Nusserwanji Tata frequently visited the place, and at length acquired the bungalow for Rs 30,000. On his death it passed to Mr Jamsetji. He, in turn, left it to his elder son, who rebuilt the place, and enlarged it to a more convenient size.

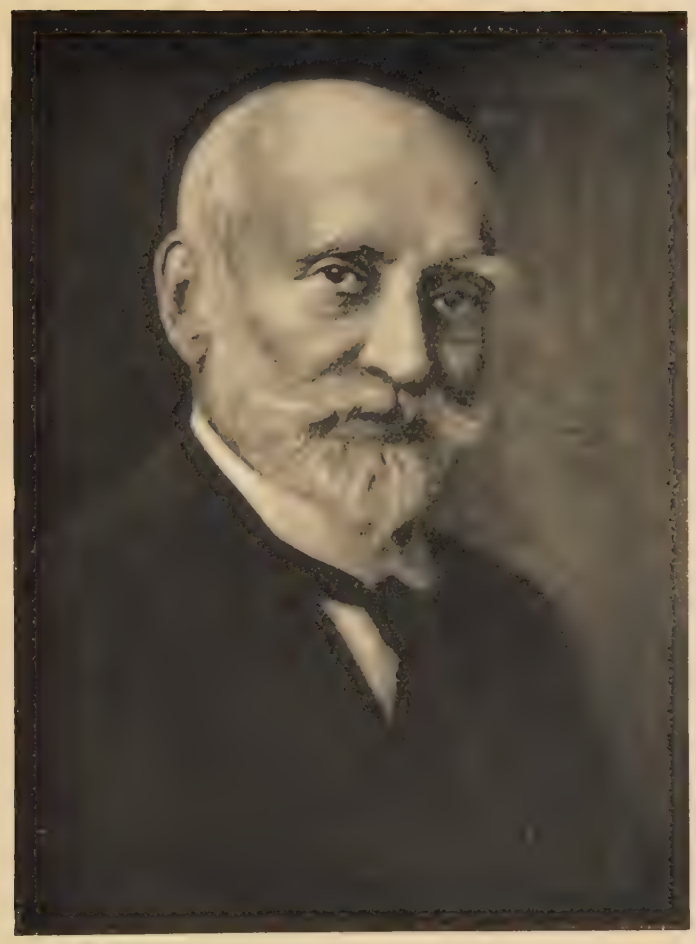
Building became one of Jamsetji Tata's chief hobbies. He bought land on the islands of Mahad, Juhu, and Bandra, on each of which he built bungalows. In Anik, on the island of Salsette, he acquired a house and a whole village. The estate was 'Khoti' land, held upon a privileged tenure, and Mr Jamsetji was the 'Khot', who exercised certain seignorial rights. He had also a house at Panchgani, and a bungalow at Ootacamund, one of his favourite resorts. In 1886 he inherited his father's estate at Navsari, where Nusserwanji Tata had bought a considerable amount of land. There Mr Jamsetji formed a small menagerie, stocked it with

wild animals, and made the surrounding part of his property into a public park for the pleasure of the inhabitants.

Mr Tata did not build only for himself. He was one of the first men in Bombay to provide flats for the man of attenuated purse. The European could rarely find a dwelling-place suitable to his needs which would enable him to remain in the city during the trying period preceding the monsoons. Those who had not sufficient money for a prolonged sojourn in the hills, or who were kept in town by the calls of business, suffered lamentably in health. Ventilation was so neglected that at periods, when the windows were perforce closed, the heat was intolerable. If illness came, the sanitary and domestic conveniences were a positive danger. In addition, many of the houses were none too clean, and at night they were crowded with servants sleeping on the corridors or landings, and were lit with ill-smelling oil lamps.[1] As a rule they had been built for Indians, who were accustomed to the eastern climate, and to whom use had given the power to battle with insanitary conditions.

Before Mr Tata built his flats the Englishman of modest means was compelled to live in unsuitable surroundings. Gymkhana Chambers marked a new era. On an open site near Esplanade House, close to the business part of the Fort, Mr Tata commissioned the architect of his own mansion to erect a block of sixteen flats, four on each floor, entirely detached from other buildings. On the roof, which affords a fine view of Bombay, were placed large iron tanks, ensuring an adequate storage of water. Mr Tata took a keen personal interest in the comfort of his future tenants. 'Will you please instruct Mr Morris,' he wrote to his son Dorabji, 'to lay down water to every bathroom, as I propose to have a fitted bath [and] closet to every suite. He must also make arrangements for a little room, say 6 × 6, on the third floor for a boiler to heat water for use in the whole

[1] *Times of India*, 8 June 1896.



SIR DORABJI TATA

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house.'[1] Floors of mosaic were set in cement; and the rooms were spacious and well ventilated. Electric light, at that time an innovation in India, was at once installed throughout the building, from the private installation in Esplanade House. Kitchens and offices were made compact and convenient. From the first the management was excellent. Mr Tata proved a model landlord, and when Gymkhana Chambers became part of the property, which was handed down as a trust for the support of the Institute of Science, his tradition of good management was retained.

During the early nineties Mr Tata largely increased his purchases of real property. He was convinced that the value of land in Bombay would steadily rise; and he had conspicuous faith in the prospects of the city's advancement and growth. For some few years he obtained large overdrafts from his bankers. His business was so far from being speculative, that he could estimate his annual surplus with sufficient accuracy to ensure the necessary accommodation. Most of his overdrafts were invested in the erection of buildings, or the leasehold of lands acquired either from the Bombay Port Trust, the Improvement Trust, or from the Government. At that time the majority of capitalists preferred freehold land to leaseholds, even of 999 years. Mr Tata, however, who had no prejudice in the matter, was able to acquire leasehold land at almost nominal prices. He obtained his plots at a capitalized value which averaged Rs30 the square yard, and even then predicted that the land would soon be worth Rs1,000: an estimate which has been fully realized. When the Cooperage Estate was put up for sale, he acquired two plots which he utilized for building, and at that time he proposed to purchase the remainder.

It was during this period that he reversed his financial policy. For some considerable time a project of magnitude had been simmering in his mind, though he had not mentioned it, even to his most intimate associates.

[1] Mr J. N. Tata to Mr D. J. Tata, 12 October 1893.

In 1883 he brought into the firm, as personal assistant, Mr A. J. Bilimoria, an able graduate, who had been recommended to him by Mr Padshah. From the first moment Mr Bilimoria enjoyed the fullest confidence of his chief, and became his right-hand man in the management of his property. Suddenly Mr Tata bought the lease of a large plot upon the Apollo Bandar to be reclaimed by the Port Trust for the erection of an hotel. 'As in the case of all his enterprises,' his assistant writes, 'he developed the idea more out of patriotism and his love for the city, than as a commercial proposition, because he believed that Bombay ought to have a big hotel in the near future to cope with the growing prospects.'[1] Mr Tata possessed neither the inclination nor the experience necessary for such a business. As he told Mr Lovat Fraser, he had no desire to own the place, but he wished to attract people to India. He did not know what the building and equipment would cost, nor had he calculated either the expenditure or the possible receipts. He knew he was running a risk. He knew that the investment would compel him to forgo the immense profits which he would have obtained by developing the Cooperage Estate. 'But,' says Mr Bilimoria, 'as he believed that the installation of an up-to-date hotel in Bombay was one of the essential conditions of the city's advancement, and that no other capitalist was likely to venture, he considered it was his duty to provide the want.'[2]

In 1898 the foundations of the hotel were laid upon the Apollo Reclamation, of which about 10,000 square yards was acquired by Mr Tata from the Port Trust of Bombay upon a ninety-nine years' lease, with an option of renewal for a like term. The Wellington Mews, occupying upwards of 12,000 square yards on Wodehouse Bridge Road, were built concurrently with the hotel. While in course of construction both properties were transferred to a joint-stock company, the whole of the capital, amounting to 25 lakhs, being taken up

[1] From notes by Mr A. J. Bilimoria. [2] ibid.

by Mr Tata, whose firm became the agents of the Company, and had control and superintendence under a Board of Directors. Four years later (1906) the capital was raised to Rs30,00,000, Messrs Tata taking over the new issue of Rs5,00,000 at a premium of 20 per cent. A debenture loan of Rs18,00,000 (roughly £110,000) was also raised on the security of the Company's property.

In building the Taj Mahal Hotel, Mr Tata hoped to dispose of the lease to an English company, but the negotiations fell through, and he found himself with the venture on his hands. As he had expended nearly £300,000 upon the building and appointments, he decided to complete the work. In 1902 he visited London, Düsseldorf, Berlin, and Paris to make a number of purchases necessary for the equipment, and his sons kept an eye upon the building and decoration. To the elder he wrote: 'I am extremely sorry I should unintentionally have injured your feelings in connexion with the construction of our new hotel. I thought you had already enough to do to attend to the mill business, and you would be coming in only as a critic of what others were doing. Of course, as you should know by this time, the canons of architecture, decorations, etc., are as yet very arbitrary: even in Europe ideas differ so widely that all the continent still laughs at the pretensions of English architects and vice versa. America has wonderful ideas of beauty, or some would call ugliness. Fancy their fondness for brick red interiors for their drawing and dining rooms; we may excuse this in a bedroom, if the inmate likes it, as a warm colour, but some people regard it as hugely ugly. In this matter, there is no science of taste established, though it is possible at some remote time such an universal agreement may be brought about. But taste in this matter keeps so constantly varying that often fashions change every few years; and what goes out now, may come back five or ten years hence. Under the circumstances, we must try to do what we think our customers would like. But even here we are likely to be at fault; there are no two hotels alike in

decoration or furnishings, and in such cases somebody with the greatest and most varied experience should be left a free hand. Your experience by this time must be considerable, and I have no objection to leave matters in your hands. But I trust you will take as little as possible from the modern "esthete" and avoid their abominable yellows and reds as much as possible. I am trying to leave instructions behind to finish up all our remaining orders in connexion with the hotel. We have just placed our order for electric lighting, lifts, engines, etc.; and one about the chandeliers, globes, etc., I will place at Berlin on my way to Trieste, from whence I start in company of Ruttonji and his wife on the 3rd of next month by the S.S. *Imperator*. In conclusion, let me trust that you will free your mind from the suspicion that I distrust your taste in architecture and cognate subjects.'[1]

In any case Mr Tata had his own way. If the Taj Mahal Hotel loses somewhat by its conventional decorations, it compensates for this by the splendour of its exterior. In selecting a site close to the sea, Mr Tata added a new ornament to the Gateway of India. On two and a quarter acres of ground, and on foundations 40 feet deep, he erected an imposing structure flanked by two wings, giving ample room for a large courtyard, which affords through ventilation. The breezes from the sea are allowed freedom to circulate; while long aisles, which rise to the roof, and terminate in lanterns, assist in carrying off all noxious exhalations. The architecture, the work of a Hindu draughtsman, who carried out Mr Tata's own ideas, is eastern in style. Domes flank each corner of the mass; and the large central dome, from whatever side it is viewed, is a conspicuous feature of the city and a landmark to the traveller. Bay windows, glazed with tinted glass to temper the glare of the sun,

[1] Mr J. N. Tata to Mr D. J. Tata, 1902. Mr Jamsetji did not agree with the aesthetic tastes which his son had acquired at Cambridge, nor did he admire the Morris wallpapers with which Mr Dorabji had decorated his rooms at Caius.

THE TAJ MAHAL HOTEL

facing p. ...

break the contour of the grey stone walls. A veranda on the first floor, and balconies which run along the front of the main block, afford a pleasant outlook upon the magnificent harbour with its everchanging contents; great liners cheek by jowl with little dhows, and fishing-boats with their brown sails flitting across the bows of stately brigs.

Mr Tata's travels had made him zealous for the reputation of Indian hospitality. He saw how far his own city failed in providing a traveller with the comforts and luxuries obtainable in Europe and America. He planned everything on a liberal scale. The rooms were designed both for the man of modest means and for the millionaire who desired a luxurious suite. To the traveller or hotel manager of the present day a recital of all the arrangements would seem a mere commonplace, but to the Indian, who had never left home, the new contrivances, brought from distant lands, were a constant source of wonder and delight. In Asia the Taj Mahal Hotel marked a new era. Its founder was one of the first men in India to appreciate the future of electricity, and his house in Bombay was the first in which the new power was used. When visiting the Düsseldorf Exhibition, he made arrangements with a German firm to carry out the electricity for the hotel at a cost of two annas a unit. He fitted up an electric laundry with electrically heated irons. His kitchens, cellars, and service were of the latest type; he insisted upon the most modern sanitation; he catered for the luxury of visitors by providing them with a Turkish bath, a post office, a resident doctor, and a chemist's shop. At the outset, despite all these conveniences, the business of the hotel did not reach anticipations. It was opened in 1903, with about twenty visitors, and then passed through that period of tentative experiment common to ventures planned on such an extensive scale. After Mr Tata's death, his sons carried on the work, and in 1915 the business at length attained the prosperity which he designed and foresaw.

While building the Taj Mahal Hotel, Mr Tata purchased two small islands near Uran, called Panjoo and Dongri. He wanted to use them as quarries for stone and rubble in reclaiming his low-lying lands; and secondly, he wished to exploit the islands as adjuncts to the hotel. It was his intention to erect there one or two bungalows, which, when furnished, could be used for picnics. Parties from the Taj Mahal could sail across in the boats belonging to the Company.

These minor schemes, which Mr Tata put forward, did not always mature. He had for many years taken a particular interest in the northern suburbs of Bombay. From time to time he acquired considerable property in the island of Salsette, the most eligible site for the development of the city. The island, which has a westerly sea-front of some fourteen miles, is penetrated by navigable creeks, and to sail among the creeks was one of Mr Tata's occasional diversions. The surroundings are attractive and picturesque; the scenery in some ways reminded him, so he said, of the Scottish Highlands and the English Lakes. On the open waters, away from the noise of the city, he could give free rein to his thoughts. An English friend who was with him relates that on an early morning cruise from creek to creek, Mr Tata took from his pocket Ruskin's Newdigate poem, 'Salsette', and read it aloud with great gusto as the vessel sailed along the coast. 'My trip with him through these waters,' says the writer, 'was one of the pleasantest.'

Since 1896 Mr Tata had contemplated plans for the development of Salsette. The severity of the plague drew attention to the overcrowding of Bombay, and the urgent need for developing its suburbs. On the island, within eight miles of the heart of the city, acres of land lay waste. A few lean kine picked their precarious sustenance from the scanty herbage; the remainder of the ground was covered with scrub, and intersected by swamps, the breeding-ground of a virulent mosquito, which spreads the germs of malarial fever. The inhabitants of these undesirable tracts were mostly peasants who

dwelt in extremely poor and insignificant villages. Each year, during the cold season, a few hardy pioneers were accustomed to pitch their tents on the drier patches, and some braver souls had begun to build houses in an irregular fashion, unsightly to the eye. During the plague there was a large increase in the population of Salsette, particularly near the stations along the two railways, where small residences, fit for single families, sprang up at a fairly rapid rate. These settlements were referred to as suburbs. 'Their becoming so,' said Mr Tata, 'is now only a potentiality, as the process by which they could have been made to justify the name of suburbs, as understood in England, has been effectively put a stop to by the recent revenue policy of the Government of Bombay.'[1]

For several years Mr Tata tried to obtain a reversal of this policy. During the speculative reclamations of 1865 a series of building fines had been imposed upon undeveloped land, and these fines were heavy enough to hamper anyone who attempted to cope with the housing problem. No one, even the most case-hardened official, questioned the benefits which would accrue to the locality if the waste lands were converted into a comely suburb. No one, however, had realized the legal obstacles to such a conversion. Land tenure was in India complicated by relics of feudalism, and by a tangle of customary rights. In the mind of the Government it was inseparably connected with revenue. Before he attacked the problem, Mr Jamsetji was well aware of this obstacle, but he had no hesitation in throwing down a challenge, in an endeavour to obtain a remission of the fines.

In the undeveloped districts Mr Tata owned some property north of Bandra. There he planned the provision of houses at a moderate rental, such as would help to relieve the congestion of the city. It was already recognized that he 'had done more than any single human being to provide Bombay with buildings fit to live in',

[1] Mr Tata to Lord Curzon, 9 May 1901.

and there was a cry of disappointment when it appeared that his schemes were thwarted by what seemed an obscure and unreasonable tax. The proposed development lay in the district of Thana, and the Collector, in his official capacity, pointed out that a building fine of Rs1,500 an acre would be levied not only on the actual houses but on the gardens and compounds, whether fenced in or enclosed by a wall. Such a tax would have turned a profitable venture into an enterprise which no business man would entertain for a moment. The case for Government was that the revenue would be deprived of any benefit from the ground rent, should the periodical survey of the district warrant a further revision of the tax. With the building fine the annual assessment would have been equal to about 4 per cent on the value of the property. It was pointed out that in Bombay itself the rates and taxes did not come to one-fourth of this amount, though water, light, and police protection were there provided.[1]

Even if these figures were not correct to a decimal point, they serve to show the arguments brought forward by those who supported a garden suburb. Meanwhile the supporters found a determined champion in Mr Tata, who, on their behalf, addressed a lengthy memorial to the Collector of Thana. It is not necessary to give the whole document, but Mr Tata argued that the fine was 'out of all proportion to the increased revenue that Government would in any case reasonably expect to derive, owing to the improved conditions of agricultural land'. If the ground rent, he said, was Rs8 an acre, and was, owing to better agricultural conditions, increased by 50 per cent, the capitalized value of such an increase, at 4 per cent, would amount to Rs100 an acre, which in some cases would exceed the actual selling value of the land.[2]

The obstructive imposition seemed to him all the more strange, as the City Improvement Trust had been

[1] *Advocate of India*, 10 August 1899. *Times of India*, 6 June 1901.

[2] Mr J. N. Tata to the Collector of Thana, 25 July 1899.

created in order to transfer the population of the overcrowded parts of the city into large and healthy areas, such as the island of Salsette could undoubtedly become. 'I cannot conceive that this prohibitive fine is imposed in the interests of agriculture,' wrote he, and added: 'Unless I am greatly mistaken, advantage is being sought to be taken of the need that has sprung up for extending residential areas, for the purpose, as I humbly surmise, of raising a revenue out of that circumstance.' Mr Tata also laid stress upon the financial advantage which would accrue from the development of the district 'in all those essentials of a growing and prosperous communal life—the railway, the telegraphs, and the postal systems, and all local traffic and intercourse.' 'The growth of towns,' he continued, 'must, I need scarcely repeat, add far more to the sum of national life and national prosperity, than anything which, in the shape of an immediate addition to the revenue, can possibly be hoped for by the system of building fines.' His view was, in short, that if the repressive fines were abolished, development would be rapid, and he reminded Government that when agricultural land was covered with houses, the revenue could hardly suffer, since the property became liable to the payment of the municipal house tax.[1]

A few months later Mr Tata organized a petition from various inhabitants of Salsette, and submitted it to the Governor, Lord Sandhurst, and his Council. Within eight miles of Bombay the Government could levy a building fine which varied from Rs1,000 to Rs 5,000 an acre. Against such a demand, which seemed to him excessive, Mr Tata acted as the spokesman of those upon whom the fines most heavily weighed. 'Apart from a mere handful of Bombay residents desirous of having country houses in the suburbs,' ran the petition, 'those desirous of building residences there are mostly men of moderate means, who cannot afford to invest in this way any considerable sums. By far the greater portion of these are the permanent residents of the

[1] Mr J. N. Tata to the Collector of Thana, 25 July 1899.

suburbs themselves, who have awakened to the need of better houses and surroundings than they have been hitherto content with, and the remainder of them are middle-class residents of the city of Bombay.'[1]

In drafting the petition Mr Tata again drew attention to the lack of any systematic development. Those who had already built houses had built them in a ramshackle fashion, but Mr Tata wished that the improvements in Salsette should be properly planned, and the island made more healthy and more pleasing to the eye. During nearly four months of each year the district was hardly habitable. The proximity of malarial marshes rendered the dwellings unhealthy, and until the entire land was reclaimed these undesirable conditions were bound to prevail. The building fines were not only irksome, but were a heavy charge upon the capital expended, and the suburb bade fair to be somewhat squalid. In order to keep down the initial cost, most of those who built a house contented themselves with a loose fence round the building, so as to limit the areas on which the fines were levied. By this means portions of the holdings were excluded from the tax, but they remained fallow, unimproved, and an eyesore to the neighbourhood. Drainage was limited by the ideas and the purse of the owner, though in every case he was bound to sink a well. The Government argued that the fines had not checked building operations, even in Bandra and Santa Cruz, but Mr Tata and his co-memorialists argued that the builders there were mainly well-to-do folk, and that a considerable part of the land utilized was Khoti land, which was not subject to any such fine.[2]

Within a few months the Revenue Department replied to 'Jamsetji N. Tata, Esquire, and others, inhabitants of Bombay and Salsette', offering, in lieu of the fines, a special assessment, 'proportioned strictly to the market value of the land which it may be proposed to appropriate to building purposes, with leases for a

[1] Mr Tata's petition to the Governor of Bombay.

[2] The inhabitants of Salsette to the Governor of Bombay.

considerable term of years'. So far, so good. But His Excellency the Governor in Council was at pains to point out that many of the signatories were capitalists, and not residents 'of moderate means and small requirements'. And so Government demanded the full market value of the properties, such as would be paid without demur to any private vendor, and declined to sacrifice the unearned increment 'in favour of either capitalist investors, or of the occupants who hold their land at an assessment based solely on its value for agricultural purposes'.[1]

Mr Tata was distinctly nettled by the imputation that the fight against the building fines was in the interest of a group of 'capitalist investors'. Later, when submitting his case to the Viceroy, he pointed out that he was the only capitalist who had extensive land in the suburb in question. 'I was ready and willing,' he wrote, 'so far as my own holdings were concerned, to submit to the highest assessment and fines they (the Government) chose to levy, provided justice were done to the large body whose cause I was deputed to advocate.' He pointed out to the Revenue Department that the allegation was wholly unfounded; and that it was felt by him and his co-memorialists to be both unjust and cruel. He added that his position as spokesman was not of his own seeking, but one which he only accepted owing to the earnest desire of others.[2]

Before Mr Tata drafted his reply to the Government he received from the Collector of Thana an answer to his request for the abolition of the fines in Bandra and Santa Cruz. Though some apparent concessions were made, they seemed to Mr Tata complicated and illusory, 'causing no little surprise and disappointment'. Indeed they seemed to him an aggravation of the burden. In answering the Bombay Government, he called attention to the reply from the Collector: for while Government had held out some hope of a certain measure of relief,

[1] Revenue Dept. to J. N. Tata, Esquire, and others.

[2] Mr J. N. Tata to Lord Curzon, 9 May 1901.

the Collector's letter had dashed these hopes to the ground. The memorialists next put forward 'a concrete case to show how far from amounting to any relief is the proposal for the imposition now contemplated by the Collector'.[1] 'Were the proposed measure adopted,' wrote Mr Tata, 'a holding of the purchaser in the suburbs of Bombay would have cost him full twice as much as he would have had to pay elsewhere.'[2] Mr Tata had recently bought some land within the municipal limits of the city at rates far below those demanded by Government in the island of Salsette.[3] He submitted that the Collector was apparently under a misapprehension as regards the intentions and wishes of Government, and asked Lord Sandhurst to decide on the specific mode of relief which the Government was prepared to grant, and then to issue explicit instructions on the subject.[4]

Within a fortnight Mr Tata received a reply, but though the Government appeared obdurate, this tedious contest did not deter him from further efforts. He got wind of a proclamation of 1801, applied to over ten thousand holdings in Salsette, which appeared to afford a loophole: for the owners held their property by virtue of certain deeds of grant upon definite terms, and were liable only to a permanent, and not a variable assessment. He then instructed his solicitors to obtain particulars of the tenure of each of these individual holdings. Though Mr Tata offered to pay the whole expense of the search, the Revenue Department refused to undertake the work. At length the Government accorded him permission to examine each deed, provided that he could furnish the area of the property and the name of the owner. As this was the very information which Mr Tata desired, he was once again at a dead end. He instructed his solicitors to answer the Government. 'It is perfectly useless,' they wrote, 'as you must know by this time, to ask

[1] Mr Tata to the Governor of Bombay, 10 April 1900.
[2] ibid.
[3] Mr Tata to Lord Curzon, 9 May 1901.
[4] Mr Tata to the Government of Bombay, 10 April 1900.

our client himself to furnish what can only be in your own possession or within your own means of knowledge.'

In view of such obstruction, Mr Tata found it difficult, as he said, not to believe that the benevolent intentions of the Government of Bombay were frustrated by the Revenue authorities.[1] The decisions of the Collector were received with the keenest disappointment, not only by the memorialists but by the general public. 'In a controversy with Government,' wrote Mr Tata again, 'subjects are generally at some disadvantage, and they are especially so after a pronouncement which Government intends should be regarded as final and conclusive.'[2] But Mr Tata still hoped that he might obtain a reconsideration of the case. He claimed that, with regard to a large proportion of the holdings in Salsette, the Government had permanently renounced all proprietary rights in the soil with the reservation only of a fixed rate of assessment. His attention had recently been drawn to a case in which the decision of the Courts seemed to favour his contentions.[3] Armed with these weapons, he suggested, in another lengthy memorial, that he and his co-memorialists should 'make the question the subject of a friendly suit in the High Court of Bombay; a suggestion which it is hoped will meet with the approval of Government'.[4] Three months later the reply from the Revenue Department was sent to Mr Tata: the Department still insisted that the inhabitants of Salsette were liable to the building fines, and rejected the suggestion of a friendly suit.[5]

Since the Government of Bombay remained immovable, Mr Tata decided to carry the case to a higher court. Throughout his term of office Lord Curzon displayed a keen interest in the land question, which

[1] Mr Tata to Lord Curzon, 9 May 1901.
[2] Mr Tata to the Revenue Dept., 7 August 1900.
[3] ibid. [4] ibid.
[5] Revenue Dept. to Mr J. N. Tata, 23 November 1900.

he regarded as one of the most dangerous weapons in the hands of the agitator.[1] In 1901 Mr Tata appealed to the Viceroy, to whom he submitted all the correspondence. 'There is no alternative left to the memorialists,' he wrote, 'short of active and contested litigation with Government, such as they do not at this stage approve, desiring rather to approach Your Excellency with the present representation.'[2] Mr Tata then asked that Lord Curzon would grant such relief as His Excellency saw fit. He suggested a declaration that would have protected the ten thousand landholders of Salsette from any enhanced demands, and would have ensured a fixed and moderate assessment inducing people to acquire sites for houses.[3]

During the whole of these prolonged and futile negotiations Mr Tata worked with his usual thoroughness. He had a high ideal of his duty as a citizen; and if the magnitude of his interests is taken into consideration, it is obvious that he set aside a generous portion of his time to fulfil that duty. He cannot have wasted a moment, for, at the time, he was engaged in the building of the Taj Mahal Hotel, the search for iron-ore, the formation of the Hydro-Electric Syndicate, and the foundation of the Institute of Science. His sons and his cousin, as well as his personal assistants, Mr Bilimoria and Mr Padshah, rendered him valuable assistance, but his was the master mind. He spared no expense, printing all the correspondence, and circulating it in the form of Blue books. It was, as he admitted, a thankless task, and there is nothing among his papers to show that he was successful in obtaining a remission of the fines. He had, however, some cause for satisfaction. The press and the public both supported him, and in 1902 the Government submitted to the Imperial Parliament a report on the land revenue of India, and its incidence. As far as he himself was concerned, the matter was one

[1] See Lovat Fraser, *India under Curzon and After*.
[2] Mr Tata to Lord Curzon, 9 May 1901.
[3] ibid.

of indifference. He was prepared to stand aside and let Government do the work; or, as he said, they could levy their highest assessment and fines upon his own property, provided justice was done to the poorer holders whose cause he was deputed to advocate.

His later life was indeed an accumulation of interests. He had made his fortune in cotton and had acquired property in many places. His means were ample; and as he drove about the city in his smart turn-out, he was recognized as one of her leading men. He was never idle. When other men sought leisure, Jamsetji Tata seemed to seek work. Before he knew the result of his battle against the building fines he had embarked on another scheme, the reclamation of certain lands round the Mahim Creek. Some twelve hundred acres were involved, half of which were near Bandra and Santa Cruz, extending thither from the Lady Jamsetji Causeway. In presenting his plans to the Collector of Thana, Mr Tata put forward the benefits which would accrue to the city. 'The chief advantage I am looking forward to,' he wrote, 'is the improvement in the health of Bombay consequent on the reclamation of drowned lands, the malarial exhalations from which are at present carried to Bombay island by the north wind. I propose to clear the swamps of the present growth of mangrove, and to convert them into a pasture-ground for milch-cattle. Some bushes that thrive on salt water yield a most valuable fodder for cattle; and this vegetation would absorb the salt water flowing over the ground at high tide once a fortnight; and thus Bombay would be free of the nuisance of unhealthy winds that pass over tracts which are alternately dry and under water. The pasture-ground would help the health of Bombay not merely by contributing to check malarial breezes, but it would also improve the quality of meat by permitting superior grazing to the cattle brought for slaughter. It is possible that later I may find it not unprofitable to construct on a larger scale stables on reclaimed ground for the quartering of buffaloes whose accommodation now

within the city appears to me not contributory to its health.'[1]

Mr Tata had already made similar experiments in reclamation on his lands at Anik and Kurla. He was now prepared to put some capital into this newer enterprise. 'Even if the venture should not yield much return,' said he, 'I should still consider myself adequately compensated by the resulting improvement of the value of property in the city where I have large landed interests.'[2] In addition, Mr Tata hoped to convert into fish-ponds a small inlet, known as the Mahim Creek. There, by means of self-acting flood-gates, he intended, during high tide, to admit the younger fish from the sea, through gates constructed in such a manner that only the smaller fish could enter this area; when fully grown they would be too large to escape. The supply of white salmon, red mullet, prawns, and other varieties would then form a valuable addition to the food and delicacies of Bombay.

He was, however, so eager that the work should be done, that he was again content to retire from the field if the Government cared to act. He asked for a ninety-nine years' lease of certain unoccupied and unassessed lands, provided that he had a free hand in their development. Except for the Mahim River area, he proposed to pay a rent of one rupee the acre. He also asked for the right to remove earth, stones, sand, and the necessary material for reclamation, without those payments for quarrying usually levied by the Government. 'In conclusion,' he wrote, 'if my offer here made be not acceptable to Government, I request that Government will be pleased to suggest their own terms and conditions.'[3]

With his complete memorandum, Mr Tata submitted a budget of correspondence which, for more than a year, had passed between himself and the various authorities: collectors, municipalities, railways, telegraph departments, and all those interested in the

[1] Mr Tata to the Governor of Bombay, 1903.
[2] ibid. [3] ibid.

proposed concessions. Though, on the whole, the scheme was approved, many details, such as the method of drainage, remained unsettled. There were several obstacles in the way. Some of the land was required for municipal purposes, and could not be relinquished by the municipality. The Telegraph Department were fearful lest houses built of inflammable material should prove a danger to their lines. Another objection came from the small municipality of Bandra. Certain fishermen held a traditional right to fish in the waters between Mahim Creek and Sion Causeway; even if compensated, they declined to give up their hereditary fishing-ground. The military authorities were entirely opposed to the whole scheme, as part of the proposed reclamation would have interfered with their rifle range. On the other hand, the Agent of the G.I.P. Railway was most cordial in his acceptance of the plan, believing that Mr Tata would thereby create 'a favoured suburb for a class of people for whom there is now no really suitable accommodation on the Island'.[1]

Mr Tata dealt, one by one, with the various criticisms and objections. He assured the Telegraph Department that he would avoid the use of inflammable material for houses built near their lines. He promised to respect the arrangements for drainage made by the municipality of Bombay. The military authorities were his most obdurate opponents, and by them he was, as he said, considerably embarrassed. He suggested, however, that the rifle range should be removed to a spot, nearer the railway stations, which by its accessibility would 'find favour with all classes of volunteers and military men. Furthermore,' he added, 'if I am required to meet the cost of such a change, I will be only too willing to consider the question.'[2]

The negotiations concerning the Mahim River project outlasted Mr Tata's life-time, but his younger son, Mr Ratanji, and his 'constituted attorney', Mr

[1] Correspondence concerning the Mahim River Reclamation scheme. [2] ibid.

Bilimoria, continued the work. Difficulties with the municipality of Bandra, who would not give up the lease of certain grazing lands, created a deadlock. The whole project was imperilled, and progress was impossible. Mr Ratanji Tata offered his opponents sufficient land for their needs in a far more useful and valuable area. All the other participants in the scheme were satisfied, but for more than six years the people of Bandra would not resign their holding. When in 1910 the municipality was induced to relinquish the lease, there seemed no further obstacle to prevent the reclamation being carried out. Mr Ratanji was as keen as his father upon the development of Bombay, and had some admirable ideas for improving the suburbs; but the firm was building steelworks at Sakchi, and with so much in hand, the reclamations were indefinitely postponed.

These various schemes for reclaiming the islands were only preparatory to another and more ambitious project which was never brought to birth. In the course of his travels Mr Tata once visited Venice, and was so impressed by its beauty that he desired to reconstruct a Venice in Bombay. To him, the low-lying lands, intersected by shallow creeks, seemed to lend themselves to the building of suburbs which would, in a measure, resemble the pearl of the Adriatic. Both the physical features and the natural resources of the island were well adapted to such a conception. Some twelve hundred acres, bounded on the west by the island of Juhu Tara, and pierced by two inlets from the sea, could be flooded at high tide with shallow water, three feet in depth. Mr Tata proposed to reclaim five hundred plots of ground, each of one acre, and surround them by canals, with sluice-gates to maintain the sea at the required level. The soil removed by digging the canal could have been transferred to the plots, furnishing the foundation for the houses and compounds. Sufficient supplies of earth and stone were also to be obtained from the neighbouring hills.

To crown this ambitious scheme, Mr Tata proposed

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to convert the hamlet of Juhu Tara into a fashionable seaside resort. He was much in love with the place, and had there built a small bungalow, where he frequently entertained his friends. Juhu Tara is one of the healthiest sites in the vicinity of Bombay. A beach of fine white sand, four miles in length, provides a splendid gallop for anyone who loves a horse, and during recent years it has become a favourite resort for mixed bathing. Covered with comely houses, such a suburb could hardly have failed to attract a number of wealthy residents. His plan seemed so feasible that the Collector of the district adopted it as a Government proposal, but nothing was then done, and Mr Tata's ideas were left as a legacy to future generations.

Another of Mr Tata's imaginative projects never passed beyond the mind of the inventor. It began and ended with artificial ice. About 1900 he planned out a small but useful scheme for increasing the food supply of the city, and set up a cold-storage plant for fruit and fish. Such small beginnings suggested the idea that supplies of meat and fish should be sent to the northern provinces in refrigerating cars, which would return laden with fruits for Bombay. Then he allowed his imagination a free rein, and evolved the idea of a huge building to be erected on the site now occupied by the Prince of Wales Museum. Plans were prepared for a circular edifice, surrounding an immense ice-house, where the process of manufacture would cool the surrounding air and the whole building. Round the great well were offices which could be let to merchants or bankers, while the remainder was reserved for public rooms, in which concerts and entertainments could be held in a cool and equable temperature. So pleased was Jamsetji Tata with this child of his fancy, that he hoped to see similar structures erected by the Government for public offices and barracks. One of the heaviest charges upon the Indian exchequer is the cost of the annual migration of troops and officials to the hills, but Mr Tata imagined that the day was near when men could remain

at their usual stations, and work in a temperature regulated by artificial means, in the process of manufacturing sufficient ice to satisfy the manifold needs of Bombay.

Despite disappointment and obstruction, Mr Tata left his mark upon the city which he so greatly admired and loved. The man of modest means owes to him a debt of gratitude for the building of Gymkhana Chambers. In constructing the Taj Mahal Hotel, he beautified Bombay, and enhanced the social amenities of the city by providing a luxurious hotel where Indians and Europeans could entertain one another. But while he spent a large portion of his wealth in buildings and land which yielded a handsome profit, he did not neglect the labouring classes. 'What an education it is,' said one of his friends, 'to look at and to live in the model cottages and houses which Tata has built, and to contrast them with the filthy chawls of greedy landlords, where dirt and disease are as constant quantities as the rent collector.'[1] Eight years after Mr Tata's death the leading citizens of Bombay assembled to look for the first time upon his statue. 'The memorial which I have the honour to unveil,' said the Governor, 'will recall to future generations the life-work of one of whom the Parsee community, the Bombay Presidency, and all India may be justly proud. It will enshrine for the youth of India the great example of a real patriot.'[2]

[1] Mr Justice Chandavarkar, on the proposed memorial to J. N. Tata, March 28 1905.

[2] Lord Sydenham.

CHAPTER V

MINOR MATTERS

Apart from Mr Tata's greater undertakings, he had numerous minor interests. Year by year, the income derived from the three cotton companies he had founded, and the property which he had bought, reached a larger figure. Though his fortune was by no means fabulous, nor the undertakings of his firm so extensive as after his death, he could at fifty years of age be accounted a rich man. The disposal of his wealth was carefully planned out. Regarding it as a trust, he invested it in various schemes for the benefit of India. The larger portion was allotted to education, and any further surplus which he could set aside was spent upon the examination of some problem or upon industrial experiments. If these failed, as in some cases they did, he was not disheartened, but turned his mind towards some new project by which he could give expression to his practical patriotism. He set a clear example to his countrymen, and did much to encourage them to follow in similar paths.

When Mr Tata was a stripling, India was in a state of transition. The middle of the nineteenth century found her still, in the main, an agricultural country. Her industries were sporadic, and had only reached an elementary stage. The next fifty years saw a rapid change. Factories sprang up in the larger cities; the towns themselves took on a modern air, and as the century came to a close India could look forward to an industrial future. Among the men who wrought this change Jamsetji Tata played a prominent part. He was one of the most widely-travelled Indians of his time, and never returned from a journey without a bevy of new ideas, which he was prepared to contribute to the common stock.

Many of his minor interests were directly connected

with his business. After the Svadeshi Mills had become an established success, he journeyed to Japan with a definite object in view. The Svadeshi had been reconstructed in order to spin finer counts for the eastern markets, but the excessive costs of transport proved a bar to their expansion. Mr Tata had long been disturbed by the high freightage charged by the steamship companies for the carriage of cotton goods, yarn, and opium.[1] His active mind was considering the possibility of making India her own carrier to the Far East, for the cost of carriage, due to lack of competition, made considerable inroads upon the profits of the Indian mills, and though Mr Tata was mindful of his own interests, he saw the benefits which would accrue to India if she developed a mercantile marine. Patriotism spurred him into action. He was well aware of the advantages derived from the ' invisible exports ' of a carrying trade. A country which relies upon the ships of its rivals accepts a permanent handicap, and India suffered, as she still suffers, from such an unenviable position. She had at one time possessed the nucleus of a merchant fleet. From the eighteenth until the middle of the nineteenth century Bombay and Calcutta boasted yards which turned out simple but serviceable sailing vessels to carry the wares of India, and, for some years, the Bombay yards built a number of fighting ships for the British Navy. Many of these gained renown in battle, and such frigates as the *Cornwallis* and the *Minden* were considered equal to any English man-of-war.

When Mr Tata entered the field, and endeavoured to establish a line of steamers, he was already well acquainted with the difficulties which faced him. Since 1859 the Tatas had retained their interests in the Far East. The business of Tata and Company, founded by Mr Nusserwanji, was distinct from Tata Sons, and

[1] The war of freights was fought in order to reduce the freights on cotton goods manufactured in Bombay, and sold to China. Indian mill-owners were not so much in sympathy with the export of Indian cotton, as it raised the price of the raw material. The export trade in opium was also of great importance.

Mr Jamsetji had little to do with the firm; he left the control of the eastern branch to his cousin. Mr R. D. Tata preferred the buying and selling of merchandise to the routine of a mill. For some years he lived in Hongkong, and from that centre, as well as from the branches at Shanghai and Kobe, he built up a flourishing export trade in silks from China, rice from Rangoon, and in various eastern commodities—a trade so extensive that it at length justified the opening of a branch in New York.

During the negotiations, Mr Jamsetji had the assistance of his cousin. Several smaller Indian firms with houses of business in China, were undersold by the greater Jewish firms who, by secret agreements, had obtained large rebates on freightage from the P. and O. Company. A few years before, Mr Tata had fought the high rates charged by the Peninsular and Oriental line, particularly on yarns, and had done so in co-operation with the Rubbatino Company, an Italian line, and later with the Austrian Lloyd. After a year of struggle he was defeated, for the two companies, on whom he relied, deserted him and entered into an agreement with the P. and O. As the exports of Indian cotton and yarn to China and Japan increased in volume, the three companies, supported by their respective Governments, formed a ring, and raised the charges to the exorbitant height of 13 and even 19 rupees on a cubic ton.

Any further attempt to break down the monopoly needed courage, but Mr Tata arrived in Japan with the object of so doing. While in Tokyo he saw the Directors of the Nippon Yusen Kaisha line, who were ready to compete in the China trade, provided that Mr Tata was prepared to take an equal risk, and to run steamers of his own. He signed an agreement with the N.Y.K. for the carriage of Indian cotton goods at cheaper rates.[1]

[1] The *Encyclopædia Britannica*, in a brief notice of Mr Tata's life, entirely mis-states the case. The passage runs: ' One of his best-known achievements was the lowering of the freights on Indian goods to China and Japan as the result of a long struggle with the Nippon Yusen Kaisha Co.' (11th Edition, vol. xxvi., p. 448.)

After leaving Japan, Mr Tata travelled first to Canada, and thence to America, where he visited the Chicago Exhibition. He then proceeded to England. During his journey he had leisure for thought, and his determination to compete against the larger lines took practical shape. As soon as he arrived in London he chartered an English vessel, the *Annie Barrow*, at the rate of £1,050 a month. He decided to build up a line of his own, and began to work with great spirit, and with hopes which were unhappily frustrated. 'I suggest that it be called the Tata Line,' he wrote to his sons, 'so that it may serve as an incentive to our family to make it a permanent one, as far as it may be in our power. Then I am going to supply other chartered steamers with our house flag, which is to be blue ground, with Humata Hukta arms (Huarasta), gold circle, human hand with wire and pigeons' wings. . . . This,' he wrote again, 'is not only for the good and benefit of our firm or family, but for that of our community, who have lost an old business of theirs: for our mill industry, in which we are so heavily interested, and on which the prosperity of Bombay so much depends. I am an old man now,' he added, 'and cannot take any active part in this business, but I will have reason to be proud if the Tata family and its young ones make a name in Bombay by efforts directed towards its prosperity and glory. . . . After having taken so much trouble,' said he again, 'I do *not* mean to retire unless forced by circumstances. I am fairly sanguine of making it a family undertaking, as the more I enter into the question, the more sanguine I feel about the success of the scheme.'[1]

Mr Tata attended to every detail, and wrote voluminous instructions to Bombay. His letters were full of practical advice and bold encouragement. He was prepared to consider criticism, but he grew somewhat impatient over an apparent lack of enthusiasm in the communications from the firm. Meanwhile he went into the cost of coal, the proper cargoes for the return

[1] Letter Book of 1893-4.

journey to India, and other cognate matters. It was his wish that the steamers should not be idle even for a day. The new line was to guarantee so many sailings a year, rather than a three weeks' service, and the rates were to be fixed at a scale which would enable the firm to tempt their supporters by the lure of a lower freightage. Mr Tata urged his sons to ensure a minimum quantity of freight from their own mills and those of their competitors in the mill business. 'If we secure,' he wrote, 'anything like a hundred thousand bales of cotton, and, say, about two thousand chests of opium, it will be greatly to the advantage of our trade, to excite our opponents to lower their rates as low as possible.'[1]

Within a few months two ships of the Tata Line, the *Annie Barrow* and the *Lindisfarne*, with two Japanese vessels, began their chequered career. Each vessel was to run once a month, carrying coal, glass, matches, lamps, and other exports from Japan, returning thence, laden with cotton goods and yarn. At the outset the Indian press commended the extreme pluck, energy, and perseverance with which the Tatas had endeavoured to break a monopoly; the effort had 'been the subject of general praise in the industrial centre of India'.[2] Praise was premature, for the rivals were too strong. Against the P. and O. freight of 19 rupees, only 12 rupees per ton of 40 cubic feet was charged by the infant Company. The reduction in the rates for cotton, yarn, and opium varied from 29 to 47 per cent. What Mr Tata called the 'war of freights' then began in earnest, for the P. and O. and its colleagues lowered their rates to Re1.8, and even made 'the unusual offer of carrying cotton to Japan free of charge'.[3] The reductions made by the older companies were given in the form of a rebate, and could only be obtained if the shipper signed a

[1] Letter Book of 1893-4. 'Cotton' implies both yarn and cloth. The P. and O. made their largest profits out of opium, and in their agreements with the two foreign companies they reserved to themselves the sole right to carry the drug.

[2] *The Tribune*, 17 October 1894. [3] ibid.

declaration that he had not, during that period, been interested in any shipment between Japan, China, and Bombay, made by any vessel belonging to the Nippon Yusen Kaisha or Tata Lines. In addition to fighting this cut in the cost of freightage, the new Company found that an attempt was made to disparage their vessels in the marine insurance market. The *Lindisfarne*, chartered from an English firm, was privately reported as unfit to carry a cargo of cotton.

This was too much for Mr Tata. He was spending some thousands of rupees a month upon a venture which threatened to be wrecked by unfair methods. He addressed a petition to the Secretary of State for India, and at the same time put forward his case in a pamphlet.[1] Naturally he wrote with some bitterness. The need for fostering native industries and enterprises had been dinned into Indian ears. 'Our new steamship service,' he said, 'is a distinct effort in the direction desired by the Government of this country', and it was stifled at birth. It was even represented as a combination against a so-called national concern, a title to which the Austrian Lloyd and Rubbatino Companies could hardly lay claim. Neither did Mr Tata think that the English Company filled a national need. 'With scores of liners, English and foreign,' he wrote, 'plying in these waters, which our petted and much glorified Anglo-Indian Company can afford, and perhaps find it good policy to tolerate, it is only jealous of a small enterprise like ours, and while it can lovingly take foreigners and possible future enemies of England to its bosom, it discards the poor Indian for whose special benefit it professes to have come to India, and from whose pocket it draws the greater part of its subsidy.'[2]

The chief complaint which Mr Tata made was against 'the means, hardly fair, which have from time to time been used to put us out of the way'. Though the 'war of freights' had led to wholesale reductions in the cost of carriage, the reductions were not economic, but

[1] *The War of Freights* by J. N. Tata. [2] ibid.

reached 'an unremunerative and ruinous level'. It was not the first time within his experience that the P. and O. Company had brought down their charges, until their rivals were driven from the field: once that object was attained, the rates were raised 'as high as before, or higher, by way of punishing temporary deserters to the rival line'. Though shipping rates all the world over had fallen 50 per cent, the P. and O. ring was endeavouring to destroy a possible rival in order to preserve what Mr Tata called their 'inordinate gains'. He was bitterly disappointed with the attitude of the British Government, by whom his action was represented as a combination to prevent vessels, other than those of a Japanese Company, from obtaining any part of the carrying trade in cotton and opium from India to Japan.

In addressing the Secretary of State for India on behalf of the Tata Line, the owner laid great stress on the privileged position of the P. and O. Company, towards whose subsidy the revenue of India made a substantial contribution. 'This Company,' he said, 'to whose prosperity the taxpayers of India may lay some claim to have contributed, has driven off all legitimate competition from time to time, either by reducing rates to so low a limit as to exhaust the resources of its rivals, or, failing in that respect, taking such powerful rivals into partnership.' The Indian shippers had been forced to endure this tyranny, and had been unsuccessful in their attempts to evade it. 'They have now, however,' wrote Mr Tata, 'been enabled to start a movement in the success of which they entertain every hope.' He asked the Government to afford any legitimate help that the new line might need for the encouragement and promotion of its welfare. Before concluding his appeal, Mr Tata drew attention to the unreasonable rates charged by his rivals, and to the system of rebate conceded to certain favoured firms. He entered a protest against these unfair proceedings. Legal pressure was, as he knew, not within the Govern-

ment's power, but he asked for moral suasion, and suggested that the Secretary of State should remonstrate with the Directors of the P. and O. Company, a remonstrance which he believed would have a wholesome effect.

Had those engaged in the cotton and yarn trades supported Mr Tata, his memorial might have carried more weight, but though the Japanese Cotton Buyers' Association kept to their agreement and shipped their cotton in his steamers, his Indian friends deserted him. One by one the cotton manufacturers of Bombay withdrew their contracts from the Tata Line. In the local press a number of anonymous letters appeared, which either ignored, or cast doubts upon Mr Tata's patriotic motives, and depicted him as wholly out for gain. He would have been content with a small profit on his vessels, and would have relied upon those indirect profits which follow increased facilities for trade. For once he was beaten. Cautious by nature, he declined to face a severe and certain loss. Though he compelled the insurance agents to withdraw their allegations against the condition of the *Lindisfarne*, it was but an insignificant solace for the failure of a scheme which had cost him well over a lakh of rupees. Within a year the chartered steamers were sent back to England, and the 'Tata Line' was extinct. He had made great efforts for the good of India, and the Nippon Yusen Kaisha owed a debt of gratitude to one who had indirectly given them a lead in acquiring a profitable trade. The directors owned, in after years, that the success of their line was 'largely due to his earnest and energetic efforts'. Stoutly as he attacked his rivals, Mr Tata earned their respect. 'We had some passages of arms with him in bygone days,' writes a Director of the P. and O., 'which added interest to the everyday routine work of agency life. The old man died before some of his greater dreams were fulfilled, and his descendants will reap the benefit of his foresight.'[1]

[1] Mr Frank Ritchie to Mr Lovat Fraser, 25 February 1913.

J. N. TATA (1893)

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Before ten years had passed away Mr Tata resumed his friendly relations with the P. and O. Company. Trade within the Empire was rapidly increasing. Year by year the London markets were receiving larger imports of fruit from the Dominions, in particular from Canada, South Africa, and the West Indies. In this growing trade Mr Tata wished his country to have a share. The banana had become a familiar sight on the itinerant fruit-stalls of England, and in the mango India possesses a yet greater delicacy, which, to the educated palate, is one of the most luscious fruits in the world. On their estate at Navsari, both Mr Jamsetji Tata and his father had cultivated the mango on a considerable scale. Outside Bombay the fruit was grown in fair quantities, but only for the local market. There was, however, no export trade, and in 1899 Mr Tata made a few inquiries as to the possibilities of its development.

For several years he had been accustomed to send small consignments of the fruit to his friend Sir George Birdwood, who had long encouraged Mr Tata to aid him in improving the horticultural conditions of the country. Before leaving India Sir George had made arrangements for the transmission of mangoes which he gave to his friends, but, except in the case of those sent by Mr Tata, the packing was so indifferent that, on arrival, the fruit was uneatable. The success of his own consignments had encouraged Mr Tata in the idea that a new and profitable trade might be established between Bombay and London. He sounded the importers of Covent Garden as to the sale of Indian fruit, and, at the same time, suggested to the P. and O. Company that they should arrange, during the next mango season, for the carriage of 500 tons of mangoes, and other marketable fruits, in the cold-storage steamers coming from Australia. Before actually embarking upon this new venture, Mr Tata consulted the Company as to the means of placing the fruit in proper condition upon the English market. For many years the P. and O. had experimented,

in tentative fashion, upon the best methods of carrying the mango. Finding that the results of the experiments were unsatisfactory, and the cost somewhat heavy, Mr Tata put aside the venture as unprofitable both to his country and his firm.[1]

At the same time that he was investigating the mango trade, Mr Tata had in hand his project for installing cold storage in Bombay. He was already in touch with an Australian Company who were large exporters of frozen meat, but his main object was to counteract the scarcity of fish in the season of the monsoons. While drafting his scheme for the reclamation of the Mahim Creek, he had made provision for a storage lake, as he wished to stock his cold storage with Indian fish. During one of his visits to England he had, while staying near the sea, been fascinated by the sight of a fleet of trawlers, and by the magnitude of their catch. On his return to India he bought a trawling net, fixed it to a small fishing vessel, and set about investigating the seas for banks; but as he had neither proper charts, nor expert advice, the experiment afforded more amusement than profit. In addition he bought an ice-house from an American Company, to be used for the preservation of fish, fruit, and meat, but his project failed for lack of public support. He was ahead of his times; another twenty years were to elapse before Crawford Market was equipped with adequate refrigerators and cold storage.

Mr Tata's minor efforts for the welfare of India were indeed varied. At the end of 1899, during one of those periodical prospects of famine, which are the bane of the country, a writer in the *Times of India* called attention to the threatened danger in the outlying districts of a fast failing supply of water, and advocated the sinking of artesian wells, which he thought were unknown in India. Four days later the *Times* confessed itself 'unaware that a prominent citizen of Bombay had not only made

[1] See *The Fruit Grower*, 18 November 1896, and 7 February 1900. Also Mr Frank Ritchie to Mr Lovat Fraser, 25 February 1913

an extensive study of this branch of hydrostatics, but had long ago tested the efficiency of these wells in one of the very districts now smitten with famine and drought'.[1]

Sixteen years before this news became public, Mr Tata, who experienced great difficulty in finding a sufficient supply of water on his estates, had sunk a well at Navsari. The first experiment was not wholly a success and the cost was excessive, but some years later he ordered the sinking of three other wells in the district, and the work was completed with better results. Actual experience convinced the neighbouring communities of the benefit to be derived from these new wells, and Mr Tata was frequently asked to lend his plant for use in the neighbouring villages. The sinking of a well, whenever it succeeded, sweetened the water throughout the district, and the effect was 'appreciated by the inhabitants with all the fervent enthusiasm lavished in the East upon a well which provides pure water, and never fails'.[2]

The improvement of the water-supply was of further interest to Mr Tata, for he had at one time conceived the idea of fruit-farming on an extensive scale by means of irrigation from artesian wells, but the many calls upon his time and purse had forced him to abandon the project. At length he was able to take up his hobby in earnest. During a business journey to Australia he visited the great sheep farms and studied the artificial supply of water. When in France he examined the famous well at Grenelle; in England he visited a few of those near London, and he did the same in America. 'While sinking my first artesian well at Navsari sixteen years ago,' said he, 'I had no knowledge of the nature of the strata to be passed through, and I had therefore to work in the dark.' At the same time he had taken the precaution of making a preliminary survey with most encouraging results. 'As I wanted to go into the matter thoroughly,' he added, 'and did not mind the expense

[1] *Times of India*, 7 December 1899. [2] ibid.

just for once, I went on sinking the well further and further, hoping that the water would flow.'[1] He had, however, after going to a depth of 500 feet, to desist, but the experience stood him in good stead; after that he never attempted to bore down more than 150 feet, and always sunk the pipe in existing wells. In 1899 he sent to England for another set of apparatus, in order to make experiments elsewhere. The apparatus is still kept at Navsari, and is readily lent to anyone who wishes to deepen and sweeten a well.[2]

His attempt to improve the water-supply of his native town coincided with many other experiments upon which Mr Tata embarked. If he could help his people to adopt a new contrivance, to start a new industry, or to cultivate some new product, he regarded his money as well spent. On his travels abroad, his first visit was always to the local market; if he came across any fruit or vegetable which was new to him, he at once purchased trees, or plants in seed, for cultivation at home. His son Dorabji once asked him why he spent so much money on introducing trees in India, and advised his father to obtain a gardener who could show him how such trees should be cultivated. 'I am seeking for trees,' replied the older man, 'that can be cultivated and managed by an ignorant peasantry. If one tree thrives and helps to feed the people, my purpose is served.' From America, in 1902, he brought back typical pieces of furniture, in the hope that they would be copied, and would prove useful in his own country. Near his house at Panchgani he acquired land for planting the peach trees and certain nut trees which he had imported from California, and though the peaches were a failure, such small experiments provided him with amusement. At Bangalore, on the Beggar Bush estate, he had an

[1] *Times of India*, 7 December 1899.

[2] People were often compelled to go long distances for 'sweet' drinking-water. Mr Tata's wells did not reach 'artesian' water, but brought up sweeter subsoil water in practical wells where the pipes were sunk.

experimental fruit farm. Near Deolali Mr Tata endeavoured to revive the cultivation of the vine, and he made similar trials near Poona. He acquired many acres of land at Dumas, near Surat, and some property on the Tapti River, partly with the object of growing different species of grass for industrial purposes. His son thinks that Mr Jamsetji intended to convert some of the swamps into agricultural land, for he tried planting bushes against which the sand could silt up, and gradually form a stable surface.

So busy a man, most of whose time was spent in Bombay, could hardly have been expected to give the necessary attention to all these experiments; they were more in the nature of hobbies, and were never allowed to become too costly. On the introduction of one branch of industry Mr Tata expended, however, about 50,000 rupees. Though not engaged in the manufacture of silk goods, he saw that the cultivation of the raw material was an industry which might benefit his country. During his travels in France and Italy he had, with his usual ardour, studied and seen something of the cultivation of the silkworm. He regarded it as suited to conditions in India, for it was a cottage industry, well adapted to a small district. His visit to Japan in 1893 convinced him that scientific sericulture on Japanese lines could be extended to his own country. Knowing that the Japanese had incorporated all that was best in European methods, and having a well-founded regard for the thoroughness of this new nation, he felt that, through Japanese instruction, India would obtain a thorough knowledge of the trade, fortified by experiments which were better adapted to the East. He was greatly impressed by the way in which the Japanese had mastered the arts of intensive cultivation. The care of the soil was far in advance of anything done by the Indian: and Mr Tata was convinced that the introduction of a trade in which the Japanese excelled would be of direct benefit to his own countrymen.

On his return to India, he selected for his silk farm

a site in Mysore, a state which, through the influence of the Dewan, Sir Sheshadri Iyer, always lent a ready ear to his schemes. The temperate climate round Bangalore, somewhat resembling that of Japan, was especially adapted to the rearing of the silkworm, of which a healthy variety was indigenous to the neighbourhood, and could be cultivated and improved. As early as the time of Tippoo Sultan there had been a flourishing silk trade in Mysore, and it was still carried on in several villages round the capital. Mysore silk was well known, and had often been exported to Europe. Encouraged by the Mysore Government, Mr Tata, after buying the necessary ground, endowed and subsidized a small farm where Indians were enabled to study the growth of the mulberry tree, the rearing of the silkworm, the treatment of the diseases which affected it, the care of the cocoon, the reeling of the silk, and its proper preparation for the market.

He placed the farm under the supervision of two Japanese experts, man and wife, who could teach reeling, and another, who knew sufficient English and Hindustani to act as an interpreter. The latter had been one of Mr R. D. Tata's personal servants. The reeling machinery was imported from Japan, and was found to be simple, durable, inexpensive, and efficient. Under the charge of the interpreter, Mr Odzu, a number of coolies soon placed the machinery in working order, and within a few weeks the farm was set going.

Everything was done upon the Japanese model, and the dexterous fingers of Indian children were quickly trained to revive an old trade. Apprentices were given instruction, free of charge, for a course of at least three months. During this period they studied the cultivation of the mulberry tree, the rearing of silkworms, the possibility of improving the variety of cross-breeding, the detection of disease by means of the microscope, the preservation of cocoons for seed and for silk, the hanking of the thread, its packing and its preparation for the market.

From the first Mr Tata's silk farm proved successful. So satisfied was he with the results, that on visiting Mysore in 1899 he contemplated the purchase of additional land for the cultivation of the mulberry, but was unable to obtain any further assistance from the Mysore Government. Samples of the raw silk were submitted to European experts, who declared that the material was the best which had yet been exported from India. Encouraged by the reports on this experiment, the Government of India soon established one or two farms on a similar basis. Before so doing, their experts consulted Mr Tata, and in one of his letters to the Indian Government's Department of Agriculture he revealed the motive which actuated him in his experiments at Bangalore. 'The principal keynote that has impressed me much in your letter,' he wrote, 'is that you have as your principal aim to train picked natives of the country in all departments of science and agriculture. Such should be the end and object of all sympathetic persons who are at the head of all Government Departments. I have always in my limited sphere endeavoured to keep to this aim of training the native talent, and am always prepared to offer all the help and facility to those who so deserve it.'[1]

After Mr Tata's death his sons, engaged as they were in completing the heavy work which he had left to them, decided to dispose of the farm. Owing to the lack of further support by the Mysore Government, the business ceased to pay. Though the farm was originally opened in the interests of Mysore, the state was not disposed to take it over. It was then offered to the Government of India, but they, too, were compelled to refuse the task, as they had already established sufficient farms on Mr Tata's model. They were, however, prepared to publish a complete account of the Tata silk farm for the benefit of Indian industry; and they showed 'their appreciation of the useful work already

[1] Mr J. N. Tata to the Inspector-General of Agriculture, 16 April 1903.

accomplished' by presenting to the library a number of books and pamphlets on Indian sericulture.

Within a few years the farm was taken over by the Salvation Army, who had already gained some experience of the industry. In their endeavours to reclaim the downtrodden, low-caste people, and the criminal tribes, they had established schools of sericulture in various districts. For some twenty odd years Mr Tata had numbered among his greatest admirers Commissioner Booth Tucker. When the Salvationists first extended their activities to India, they found in Mr Tata a warm and helpful friend. 'He was one of the first,' says the Commissioner, 'to stand by us and encourage us at a time when to do so was encountering popular disfavour and opposition.'[1] He had subscribed to their funds, assisted them in their temperance movement, as well as in their efforts to provide better chawls, and to improve the conditions and morals of the labourer. He had often discussed these schemes with Mr Booth Tucker, and it was with natural enthusiasm that the Salvation Army, at the request of Mr Tata's sons, took over and developed the work. The name of the founder was retained, and the new proprietors threw themselves 'heart and soul into the task of carrying out this scheme in extending its operations and influence to other parts of India'.[2]

Under its new owners the Tata silk farm was greatly enlarged, and became a model for India. Similar schools had already been established in Ceylon, as well as in Moradabad, Aligarh, Bareilly, and several other towns. 'The impetus thus given to the silk industry in India,' wrote the Commissioner, 'can hardly be over-estimated. Governments, which before had given up the effort in despair, have now recommenced operations. Orders have been issued for the general planting of mulberry trees and bushes. Bulletins and pamphlets have been issued giving instructions regarding the cultivation of silkworms. Public demonstrations have

[1] Commissioner F. Booth Tucker to Mr B. J. Padshah, 1 November 1912. [2] ibid.

been made in connexion with Exhibitions. . . . In the not distant days,' continued the writer, 'when silk will have become to India what it is already in such countries as Japan, China, France, and Italy, the name of the man who launched the enterprise will be held in grateful remembrance by those who will have been benefited by his forethought and labours.'[1]

A less successful venture which Mr Tata made was an attempt to encourage the growth of Egyptian cotton in India. When he began the spinning of finer counts, he considered what could be done towards assisting his countrymen to cultivate a suitable staple. For several years he made inquiries, collected pamphlets, consulted experts, and watched the experiments which the Government of India made, and the results which they embodied in their reports.[2] On the whole, the Department of Agriculture seemed fairly satisfied with the state of cultivation, primitive as it was, and preferred to attribute its defects to the peculiar conditions which prevailed.[3]

It seemed to Mr Tata that the Government had by no means exhausted the possibilities of cotton cultivation, and, as he said, 'any experiments that have been tried have not been under suitable conditions'. He made this assertion in a memorandum which he published in 1896, and republished in 1903, upon the growth of Egyptian cotton in his own country.[4] He reviewed the state of the cotton industry in India, which he contemplated, as he said, with great anxiety. He saw, too, that the 'infant prodigy, Japan', was becoming a serious

[1] Commissioner F. Booth Tucker to Mr B. J. Padshah, 1 November 1912.

[2] See the *Agricultural Ledger* on 'Indian Cultivated Cottons', by T. H. Middleton, B.Sc. (Calcutta, 1896).

[3] See among Mr Tata's papers, etc.: (*a*) Correspondence between the Bombay Cotton Trade Association, the Bombay Chamber of Commerce, the Inspector to the Council of Agriculture, and Mr J. N. Tata. (*b*) Notes and suggestions on the growth of Egyptian cotton in India by Government officials and private individuals.

[4] *Memorandum respecting the growth of Egyptian Cotton in India*, by J. N. Tata (Bombay, 1903).

competitor in the China market, while Germany, Austria, and Belgium, as well as England, were flooding India with their manufactured goods. He called upon all his countrymen to consider how India's 'young and only industry' could be saved from utter destruction.

His remedy was the cultivation of Egyptian cotton; for a finer class of staple was needed in order to meet the growing competition in greys, dyed and printed goods, with which Europe stacked the wharves of India. He pointed out that all these were made from 30's or 40's warps, and 40's to 50's wefts, whereas with Indian-grown cotton it was hardly possible to make warps above 30's. For the higher class of goods the use of exotic cottons was necessary. 'If India,' argued Mr Tata, 'were enabled to grow for itself the long-stapled varieties, she would derive immense benefit in three different directions: such an expansion would assist agriculture, conserve the money of the country and improve the exchange. Of course,' he added, 'all this is not to be attained in a year or even half a dozen years; but if the cultivation of Egyptian cotton proves at all feasible, it may be the means of solving one of the greatest problems of the generation.'

His appeal was addressed particularly to the educated and leisured class. 'I believe,' said he, 'that every professional man in India, whether in active business or retired, has some interest in land, and nothing can be easier than for anybody to try my proposed experiment on half an acre or so under his immediate supervision.' At times the Government had made sporadic efforts to encourage cotton-growing, but these had failed, and Mr Tata wanted the people themselves to make trials on their own account. He offered to bear the burden of any loss, and to pay a proper price for firm cotton.

Jamsetji Tata well knew, however, that his scheme was somewhat ambitious. The average output of clean cotton all over India was below 30 pounds an acre, and even in the most favoured districts it was under 100 pounds an acre, while the average output in Egypt was

over 600 pounds, and the raw material would always command a better price. But Mr Tata had studied India, and had faith in her possibilities. 'In this vast continent of ours,' said he, 'we have such varieties of climates and soils, that it would not be hard to be able to find all that we want in some parts of the Empire.' He had made himself acquainted with conditions in Egypt, and saw that they were reproduced in certain districts, particularly in Sindh, where the orderly inundations of the Indus resembled those of the Nile. The Egyptian crop was sown and gathered between March and October: the corresponding climatic conditions obtained in India between October and May. He thought that the experiments which had hitherto been made had been made at the wrong season, and Mr Tata's first care was to alter the time of sowing. 'As the cost does not promise to be ruinous,' he wrote, 'I believe it to be my duty, and the duty of every well-to-do native of this country, to lend a helping hand towards making a final trial of this most important experiment.'

His appeal was not made in vain, and he soon obtained promises from a few friends, living in different localities, to try the growing of Egyptian cotton upon about half a dozen plots of about an acre each. Irrigation crops were, however, not possible in India, and it was necessary to rely upon the village well, the leathern bucket, and the bullock for drawing up the water. While explaining the methods adopted in Egypt, Mr Tata drew up minute directions as to the proper time for sowing, manuring, watering, and planting, and as he left a free hand to each of those who assisted him in his experiments, he asked that each should furnish him with a report upon the results. He begged those who had considered the possibility of growing exotics, to communicate with him, to criticize, or to apply for additional information. In conclusion, he commended his observations to all who took an interest in the material advancement of the country, 'and the well-being of its labouring poor'.

To invite a number of amateurs to take part in so

important an experiment was a bold step. It was not easy to find helpers who possessed the necessary patience and thoroughness. Enthusiasm proved a poor substitute for careful enterprise. The ' worthy men ' did not always know what to look for; they were elated by the luxuriant growth of plants and bolls, and became proportionately surprised and dejected when their unsupported plants succumbed to the weight. Precautions against frost and drought were frequently neglected, and the primitive methods which had been applied to an indigenous short staple were considered sufficient to rear an exotic. Some of his helpers had ignored the necessary ridge and furrow, others had thinned the plants, without making a selection, and want of attention had given the boll-worm full scope for its deadly work.

When the first batch of reports reached Mr Tata, he was somewhat disappointed. The forms which he had issued were often carelessly or inadequately filled up. There had been, here and there, a total lack of scientific experiment, and of any attempt to solve new problems as they arose. After collating the various statements, Mr Tata issued a second memorandum, and there is little wonder that its tone displays some impatience with the efforts of his helpers.[1] But he pointed out the various errors, and showed that, had his instructions been closely followed, the failures might have been minimized.

There was, however, some extenuation for the many defects. Nature had been unkind, for the period of Mr Tata's experiment was one of irregular rainfall. In addition, the promoter had been somewhat too sanguine, and had relied upon amateurs to display that knowledge and skill which can only be acquired by a long apprenticeship in the arts of agriculture. Yet the experiment was not wholly devoid of success, and Mr Padshah points out that in some districts the success was unmistakable.[2]

[1] Memorandum issued to experimenters with the Egyptian cotton-seed (July 1903).

[2] Memorandum by Mr B. J. Padshah in the Tata MSS.

THE FOUR PARTNERS

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In the Central Provinces, and particularly at Nagpur and Bitna, there was much to encourage the continuance of the cultivation of Egyptian cotton. This applied to a lesser extent in Hubli, Poona, and Bangalore, in parts of Gujerat, and in Kathiawad.

Had Mr Tata lived longer, the outcome of these experiments might have tempted him to further effort. He had, however, aroused discussion, and his voluntary work led to more careful investigation on the part of the Indian Government, who had already tried to cultivate American cotton. The Department of Agriculture still believed that the improvement of indigenous varieties afforded the greatest hopes of success. Experiments were also made in hybridization, though it was recognized that some years of trial would be needed for definite results. More than a single season was required to change the methods of the Indian cultivator. For two years (1902-3) the Government submitted samples of cotton to Mr Tata and his experts, who valued the samples and estimated the counts for which each was suitable. While indigenous cotton made some improvement, the exotic showed, as a rule, distinct signs of deterioration. Though the American seed gave, from time to time, a fairly satisfactory staple, the Egyptian cotton upon which Mr Tata's mind was set had not justified the cost of his patriotic experiments. As he had said himself: 'If I succeed, as I have every hope of doing, it will make matters easier still. But while we are making good profits with our own staple, I do not think it would be advisable to give much attention to this subject.'[1]

He had not, as it turned out, the time to do so. The last five years of his life were so full that an additional interest could receive only a small fraction of his attention. He was busy with the foundation of the Institute of Science, and he had to consider the possibilities of the Hydro-Electric Scheme, and the Iron and Steel Project. The Taj Mahal Hotel had just been opened, and the

[1] In an interview to *British Indian Commerce*, October 1898.

plans for reclamation also occupied much of Mr Tata's time. He made widespread efforts, in many directions, for the welfare of his country. Even his minor experiments, though not always successful, showed to those who took up his work the paths to follow and the paths to avoid.

CHAPTER VI

THE INSTITUTE OF SCIENCE

I. INCEPTION

WHEN Mr Tata had been in business on his own account for less than fifteen years, he felt justified in extending his assistance to others. Generous in his private benefactions, he was not the man to distribute his wealth without foresight. The father had been prone to spend his money upon those fire-temples and towers of silence, which provide the devout Zoroastrian with a key to the gates of heaven. Mr Jamsetji preferred to spend his upon the community. While quietly doing many deeds of kindness, he never encouraged promiscuous charities which are but a temporary relief to the inefficient. He was always ready to give, and was determined to give wisely. Though charity was to him an affair of the heart, he looked at it in a business-like way, and regarded its exercise as a duty which needed cautious investigation. ' He was of opinion,' says one of his friends, ' that service to the needy could no more be made without brains, without investigation, without the selection of the right men, and without concentration on particular aspects, than the production of any other species of goods.'[1] Yet despite his love of organization, his charity was the outpouring of sympathetic and noble emotions. Once his schemes were investigated, they were launched with generosity, and without any ostentation, or desire for either praise or reward.

Like most men who have succeeded by their own efforts, Mr Tata was sensible of the value of education, and he determined to do all that he could in order to afford to others those advantages of which he himself had made the fullest use. He believed that much of

[1] Mr Padshah to Mr Lovat Fraser, 27 August 1912.

the poverty around him was due to want of opportunity. He had experienced the waste which was caused by inefficient workmen, and the difficulty of finding satisfactory subordinates. His own observations in Europe and America had convinced him that the application of science to industry was one of India's greatest needs, and that famine and pestilence would be mitigated, if not exorcised, by a wider knowledge of the causes of the evil.

This, however, was not all. He looked at education as a whole. His life coincided with a transitional period in which the Government of India had displayed considerable concern for the improvement of their educational system. Mr Tata was born when Macaulay had just left the country, and had set to work on his *History of England*. While a member of the Supreme Council, Macaulay had persuaded his colleagues in India that the English language should be made the medium of official instruction, and that education should be based upon western methods. But in a vast continent, divided in race, in religion, and in language, it was not easy to frame a system adapted to the general need. The vernacular schools were perforce compelled to struggle on as best they could. Many of the Nationalists regarded English education as an exotic, which, as it spread, obliterated the indigenous flowers of Indian learning. Many of the Pundit class remained content with their own philosophy, ignoring the introduction of western ideas, or treating them with a scarcely veiled contempt. Despite reform, the eastern mind was in a measure unchanged, but many of the more adroit among the Indians, particularly those in Bengal, embraced with eagerness the Government's invitation to qualify themselves 'for high employments in the Civil administration of India'.[1]

Unfortunately, during this critical period, the Indian universities were purely examining bodies. The actual teaching was done in scattered schools and colleges, frequently some hundreds of miles distant from the titular

[1] *Report on the Progress of Education in India* (His Majesty's Stationery Office, 1909).

university. On the introduction of western methods, it had been the hope of the Government that 'such a spirit of emulation would be aroused among the higher classes, that it would slowly pervade the rest of their fellow-countrymen'.[1] The hope was unfulfilled, for there were many difficulties to be overcome. Years of patient spade-work were required before the necessary generation of teachers could be trained. In India the parent usually preferred his son to remain at home; with the result that neither school nor college provided that corporate life which is the essence of a university. Meanwhile the crammer reigned supreme. Even in 1899 Professor Ramsay wrote: 'The Colleges are wretched places as a rule . . . and the whole system is rigidly examinational, like London University. They are reaping the fruits of it in a number of cramming shops, miscalled colleges.'[2] To the Indian, English remained a foreign tongue; but he applied all the powers of memory and imitation, with which he was so liberally endowed, to acquire the information necessary for a degree, the stepping-stone to a post in the Government service.

By steady stages the spirit of reform slowly awakened. Each successive decade showed some slight measure of improvement. In 1889 Indian education was making steady progress, and several of the more enlightened Indians had taken full advantage of its benefits. Though the results of their educational policy fell short of the Government's ideals, the work was generously appreciated by the more far-seeing Indians. Sir Pherozeshah Mehta, an advanced Liberal and a Nationalist, spoke of the system as 'one of the most precious gifts bestowed by British rule on this country. . . . This gift of English education,' said he from the platform, 'was one of those things which was twice blest. . . . It blessed him that gave, and blessed him that took. This education was the precursor of all sorts of progress in this country:

[1] *Report on the Progress of Education in India* (His Majesty's Stationery Office, 1909).

[2] Sir W. R. Tilden, *Life of Sir William Ramsay*.

social, intellectual, educational, moral, and political.'[1] He paid a special tribute to Elphinstone College, where, said he, Mr Tata had acquired those lofty principles which guided his whole life.

For though Mr Tata was a business man, he was also a scholar. He had learned, as few have ever learned, the right use of leisure. His knowledge was never allowed to rust, and he was always eager to hand on the torch of learning. He had sent his elder son to Cambridge, and he was well acquainted with educational progress in England and America. Learning was, indeed, his chief recreation and delight. To the end of his life he set aside a portion of the day for contemplation and study. Clad in his comfortable white suit, his black cap on his head, he sat every evening within reach of his books, while he laid his plans for the betterment of India. Of the value of western education he was fully convinced, and thought that reform could best be brought about by a more generous dose of western knowledge.

So eager was he for the well-being of his country, that it only needed a spark to kindle the fire which was already laid in his heart. At length came the necessary inspiration. In 1889 Lord Reay, the Governor of Bombay, speaking as Chancellor of the University, pointed out that India was at the parting of the ways; higher education could no longer develop if the universities remained purely examining bodies. He exhorted Convocation to evolve a scheme for a teaching university, which would attract teachers from the West—'Men,' said he, 'who, fully alive themselves to the exigencies of higher education, will refuse to be satisfied with anything less than the reality. . . . It is only by the combined efforts of the wisest men in England, of the wisest men in India, that we can hope to establish in this old home of learning, real universities which will give a fresh impulse to learning, to research, to criticism, which will inspire reverence and impart strength and self-reliance to future generations of our and of your countrymen.'

[1] Speech at the unveiling of the Tata Memorial in Bombay.

Deeply impressed by Lord Reay's speech, Mr Tata began to elaborate his long, contemplated scheme which at length brought into being the Institute of Science. His practical mind, however, incited him to action while his larger plan was still on the anvil. So convinced was he of the deficiencies of higher education in India that, in 1892, he decided to send, every year, a few chosen students to England. With this end in view he framed a scheme on the lines of a deed of settlement, appointing a committee to carry out his plans. His primary object was to fit a larger number of Indians for the Higher Administrative and Technical Services, and to give them the opportunity of qualifying for the learned professions upon a scale hitherto unknown in India. The expense involved was then, as it is today, so great that the number of students was of necessity limited. Mr Tata would not encourage anything which savoured of charity. Year by year he selected a few brilliant men, and lent to each, at a nominal rate of interest, the money required for a course of study, allowing them to repay the loan in instalments according to their earning capacity. By this means the fund was conserved for future generations.[1] Nearly every one of the beneficiaries was a poor man, who, as things were in those days, could never have hoped to be more than an obscure clerk in a Government office, a struggling pleader, or a poorly paid medical practitioner. Opportunity worked wonders. Something like 20 per cent of the Indian members of the greatest Civil Service in the world, as well as some of the leading doctors and engineers of today, have been Tata scholars. At its inception the scheme laid down a certain proportion of Parsee students to non-Parsee students, but in practice it was soon found that a hard-and-fast rule might favour a second-rate Parsee, to the

[1] As each student was sent, Mr Tata, and later his sons, set apart a sufficient sum of money for his education. Up to 1924 fifty-one scholars have been subsidized. Of these fifteen are members of the Indian Civil Service, six are engineers, seven physicians and surgeons, eight educationalists, five are barristers. The funds of the scheme now amount to ten lakhs of rupees (over £66,000).

exclusion of more deserving scholars of another religion or race. This led to the abandonment of the idea of choosing candidates from any one community, and promising men are now enabled, without distinction, to get into harness. In selecting scholars the Committee has absolute freedom of choice, the best man being taken regardless of province or creed.

Mr Tata was proud of his scholars, and justifiably pleased with their success. 'Our young men,' said he, 'have proved that they can not only hold their own against the best rivals in Europe on the latter's ground, but can beat them hollow.' He regarded the benefaction not only in the light of an educational boon, but as a good investment for his country. 'Every Indian that gets into the Civil Service,' he said, 'I have calculated effects a saving to this country of two lakhs of rupees: that is what a civilian's pay, allowance, and pension come to, most of which usually goes to Britain.'[1] That the younger generation of Indians should be encouraged was Mr Tata's firm belief. He wanted to see them successful in the Civil Service, prominent in the learned professions, and prosperous in the world of business. He was always ready to give a chance to a promising young student, and the number of graduates in the Tata Companies is now considerable.

So great was his faith in his fellow-countrymen, that Mr Tata refused to accept the results hitherto attained as a true index to the limits of progress. He was not prepared to admit that the natural attainments of the Indian student were inferior to the European, but he recognized that the Indian suffered somewhat in the educational handicap. He took stock of the conditions. The sullen heat of parts of India weakened the energy so essential to original work. The ties and anxieties of family life, shouldered at an early age, sometimes created a disturbing influence; and while the climatic and social atmospheres were both enervating, Mr Tata saw that the curriculum of an Indian university was hardly

[1] *West Coast Spectator*, 9 February 1899.

calculated to engender originality or to develop independence of mind.

Recognizing these difficulties, Jamsetji Tata matured his remedial plans. When the idea of the Institute of Science first entered his mind, he determined to choose a cool and healthy site, well above the sea-level, and to extend the benefits of his project to men of mature age. He aimed at delivering the student from the tyranny of books, examinations, and lectures, by introducing a replica of the tutorial system, and transplanting to the East something of that spirit which is generated at the firesides of ancient foundations, or by that co-operation with the professor, characteristic of the German Seminar.

For some ten years Mr Tata considered the type of benefaction by which he could best achieve these aims. The steady increase of his fortune permitted him to think in large figures, though he had also to consider the finances of his firm and his family. Rich as he was, the extent of his project called for some self-denial, but he hoped for ample support from his fellow-countrymen. By astute investment he had become the largest landowner in Bombay, with a rent roll which showed a yearly increase, and he at length decided that the bulk of the 30 lakhs, which he proposed as his share of the endowment, could best be provided from his landed property.[1]

While deciding tentatively upon the methods of financing the scheme, Mr Tata had to consider its educational scope. Highly as he rated the value of a literary education, he felt that science could be made an equally valuable training for the mind. At that time the common rooms of Oxford and Cambridge were divided over the relative values of classical and scientific education. The bent of Mr Tata's mind inclined towards those who were advocating greater attention to scientific studies. He

[1] Rs30 lakhs was equivalent to about £200,000. Mr Tata's actual offer was to set aside property that would bring in a net income of Rs1,25,000 a year. But in speaking of the proposed benefaction, people capitalized it and called it 30 lakhs. The income from these properties is now considerably greater, more than twice that amount. (For the list of property see p. 67 n.)

was much impressed with the progress of the rising Powers. He saw in America, Germany, and Japan the prosperity which the application of science to industry had already produced. That a Japanese should hold a professorial chair in Chicago touched the pride of a man who believed that, given opportunity, an Indian could equally contribute his share to the advancement of learning. He justified his belief by pointing to the valuable researches of Dr Row, one of the Tata scholars, who had already gained distinction as a bacteriologist.[1] In addition, the industrial undertakings of his firm had made him acquainted with the undeveloped resources of India, and he determined, by means of the endowment, to further the industrial welfare of his country.

A task of such magnitude needed an able lieutenant who could assist with the spade-work, and in Mr Burjorji Padshah, Mr Tata had one already at hand. During the last ten years of Mr Tata's life Mr Padshah assisted and advised him in all his activities. The two men first met when the younger was still a boy, and on his father's death Mr Burjorji found himself under Mr Tata's protection and guidance. In due time, though their relations were those of master and disciple, they formed a firm friendship; the older man recognized the ability of the younger, who in turn repaid the confidence with affection, loyalty, and reverence. Mr Padshah, like his patron, was educated at Elphinstone College; he went thence to London and Edinburgh, and subsequently to Cambridge, where he worked for three years under Sir Joseph Thomson. On his return to India he became Vice-Principal of the Sindh College at Karachi; and on his resignation he offered his services to Mr Gokhale of the Ferguson College, Poona.

At this juncture Mr Tata stepped in and invited him to visit the universities of Europe, in order to bring back suggestions for the proposed endowment. Owing

[1] *West Coast Spectator*, 9 February 1899.

to his previous promise to Mr Gokhale, Mr Padshah hesitated. But once Jamsetji Tata had made up his mind, he was not easily turned aside. He advised Mr Padshah to explain matters to his friend, and to emphasize the great possibilities of the work in which he was to be engaged. Mr Padshah took the older man's advice, and was released from his engagement.

For about eighteen months he travelled in England and upon the Continent, visiting Germany, France, Belgium, and Switzerland, and meeting many educational experts. Each had his own suggestions. Lord Reay favoured schools of medical research, whose object should be to arrest disease and improve the sanitary conditions of India. Sir William Hunter advocated the furtherance of research in Indian problems, especially Indian diseases, and the chemistry of tropical vegetation. 'It is no use,' said he, 'wasting money in competition with the European universities, who have greater resources for prosecuting research in the older sciences.' His advice was on the whole similar to that given by Sir Raymond West, and both advocated a school of Indian archæology and history. Lord Bryce was also an advocate of historical research, and Sir William Lee Warner supported him. Professor Karl Pearson was of opinion that chairs of statistics, and of the philosophy of science, would prove of inestimable value. He impressed upon Mr Padshah the need of a careful selection of professors, suggesting that the appointments should be made by a Committee of the Royal Society.

Armed with a sheaf of reports, Mr Padshah returned to Bombay, and laid the results before his chief. The opinion of those whom he consulted had inclined towards an affiliation of the new institution to one of the older universities, for preference Bombay, in the form of an institution for post-graduates. Mr Tata's affection for Elphinstone College made him desirous of converting the scene of his own educational life into a teaching university. But such plans were premature. When the provisional scheme was drafted the site had not been

fixed; nor was any additional support assured. It was suggested, however, that the benefaction should take the form of a separate University or Institute of Research open to the graduates of all existing universities, and that it should be fully equipped with the necessary staff of teachers and with laboratories, a museum, and a library. Though mainly scientific, the original scheme of study was designed to include educational and philosophical subjects.

In September 1898, the outline of Mr Tata's plan and the amount of the proposed endowment were made public. The announcement of his generosity called forth a chorus of praise. 'Mother Bharati,' said a prominent Brahmin, 'has long been crying for a man among her children, and in Mr Tata she has found the son of her heart.'[1] Though a few Indians had, from time to time, given of their wealth towards the advancement of education, the Press contrasted the useless memorials which had been built, or the waterless wells which had been sunk, with Mr Tata's more practical charity. Nothing so sensible on such a princely scale had hitherto been done in India. A gift, worth £200,000, for educational purposes would have been remarkable in any country; in India it seemed a fabulous sum. Lord Sandhurst, then Governor of Bombay, expressed a hope that the scheme would assume a practical shape before the expiration of his term of office. The various journals, cognizant of this official blessing, urged the Government to give not only approval but financial assistance to the scheme, in order that the munificent gift might be used to the fullest advantage.[2] The whole subject was examined piecemeal. Leaders and paragraphs appeared in pro-

[1] *The Hindu*, 5 January 1900.

[2] Sir Dorabji Tata is of opinion that his father had at that time little hope of getting the Government of India interested in his scheme. In November 1898, Mr Tata wrote a letter to the Swami Vivekananda, adjuring him to rouse the country by a pamphlet relating to educational reform on ascetic lines, and offering to defray the expenses of publication. (See the *Life of Swami Vivekananda*, vol. iii., p. 315.)

fusion, and Mr Tata was made the subject of laudatory caricatures. The only discordant note was struck by a few Parsees, who wailed, in acrimonious tones, about the great fortune which had been diverted from their community. They were soundly castigated by the *Hindu Punch*. The journal not only devoted much of its space to lengthy rebukes, but depicted Mr Tata, in a moment of righteous anger, trampling these carping criticisms underfoot.

When questioned about the attitude of his co-religionists, Mr Tata elaborated in an interview the ideas on which his philanthropy was based. 'There is one kind of charity,' he said, 'common enough among us, and which is certainly a good thing, though I do not think it the best thing we can have. It is that patchwork philanthropy which clothes the ragged, feeds the poor, and heals the sick and halt. I am far from decrying the noble spirit which seeks to help a poor or suffering fellow-being. But charities of the hospital and poor asylum kind are comparatively more common and fashionable among us Parsees. What advances a nation or community is not so much to prop up its weakest and most helpless members, as to lift up the best and most gifted so as to make them of the greatest service to the country. I prefer this constructive philanthropy which seeks to educate and develop the faculties of the best of our young men. And if this is to be done, what I ask my fellow-Parsees is: "What difference is it to them whether it is exclusively to their benefit or open to all?" If able professors and specialists are to be obtained, the cost will be the same, whether it is only a few Parsees alone that attend their lectures, or young men of all communities. The Parsees cannot supply more than a very few students for each post-graduate class, and it would be foolish to have costly professors to lecture to only two or three Parsees to the exclusion of hundreds who are anxious to benefit likewise.'[1]

By his refusal to confine his gift to any one class or

[1] *West Coast Spectator*, 9 February 1899.

community, Mr Tata was able to enlist a prominent band of supporters. At the end of 1898 a Provisional Committee, consisting of twenty-three members, had begun constructive work. The Committee was in the main composed of Indians, among whose names that of the benefactor appears in a casual way, with none of the distinction which the ancient seats of learning have allotted to their 'pious founders'. Prior to a general appeal for funds, it was necessary to obtain a short legislative enactment enabling the trustees to hold property. When Mr Tata first mooted his scheme, he suggested that the money should be connected with a family trust. For many years he had encouraged his sons to take a part in his philanthropic projects. He believed that his foundation would gain by endowments both in landed property and shares, and by a close association with his family and firm.

When, however, in December 1898, the proposals for the Imperial University of India, as it was then called, were first made public, these financial arrangements remained purely tentative. The scope of the new benefaction was more definitely settled. The famous Johns Hopkins University, in Baltimore, was chosen as a model. A provisional scheme, embodying the chief results of Mr Padshah's inquiries, was prepared by the Provisional Committee for presentation to the Government. At the outset it was made clear that the primary aim of the new foundation was to teach, and not to examine, but it was hoped that the power to confer degrees would be granted. Post-graduate courses were designed, modelled upon the research work carried out in England, France, Germany, and America. Special courses were to be held, including courses in sanitary science for qualified medical men, and technical courses for those who had chosen a commercial career. For others who intended to follow the educational profession there was to be a course in Pedagogics, a science which at the time was receiving considerable attention in Germany, Switzerland, and America, and was even

edging its way into the older Universities of Oxford and Cambridge. It was not, however, intended that this comprehensive programme should be launched at once, but that the gradual creation of the successive faculties should be left to the discretion of the Committee.

While giving to Indian students a wide and generous choice of subjects, and an opportunity of completing their studies in Asia, Mr Tata by no means intended to keep them always in their own country. His many conversations with European men of learning, and the success of the Tata scholars, had convinced him that the wider the sphere of education the wider were its benefits. He looked forward to a day when the most able of the post-graduates should be selected for further training in Europe and America, in order that they might, in their turn, come back and strengthen the fabric which he had built. It was therefore necessary that ample provision should be made for fellowships, and that scholarships should be liberally endowed.

Such were the first proposals presented to the Indian Government. On 30 December 1898, Lord Curzon arrived in Bombay to take up his appointment as Viceroy. Within two days he received a deputation from the Provisional Committee on a matter of which he then knew nothing. Mr Justice Candy, Vice-Chancellor of Bombay University, Mr Jamsetji Tata, and three others, with Mr Padshah as Secretary, presented the draft of the scheme at Government House. The necessity for the passage of a Draft Bill was of the first importance, both for the constitution of the trust, and the power of granting degrees and diplomas. It was hoped that the Government of India would see its way to supplementing the annual expenditure by a grant-in-aid. A promise of assistance had already been received from Mysore, and it was felt that further offers from Indian princes would be stimulated by the actual contributions of the Government, though it was not proposed to make any official appeal.

In replying to the deputation, Lord Curzon at once

acknowledged the great generosity and public spirit which Mr Tata had shown 'in contributing so magnificent a sum for the promotion of a great public purpose'. He then put forward some considerations for the Committee. 'Were they satisfied that the highly-paid professors would attract a sufficient number of pupils?' 'Were they satisfied that there were a sufficient number of posts for an accretion of highly-trained scientists?' He also expressed some misgivings as to the value of an educational and philosophical side, involving a considerable expenditure upon subjects such as ethics, psychology, archæology, history, and methods of education.[1]

The reply at first sight was not encouraging, but as Lord Curzon said, he had spent some years in the study of Indian problems, and was satisfied that there were gaps at both ends of the Indian educational system. It was but his second day as Viceroy. He had in his mind a wide scheme of reform, and spoke with a natural caution, which produced a somewhat cold effect. Before the deputation withdrew, one of the members explained that the philosophical and educational branches had been included in order to add 'a completeness and rotundity to the scheme, and to give to the institution the character of a University'. Up to that time Indian archæology and history had been imperfectly studied, and the classical languages of India had been neglected. The Committee stated that they did not contemplate the immediate establishment of these schools, but were in hopes that some wealthy friends of learning might come forward to contribute the necessary funds. As for the number of pupils, the Committee had no misgivings, nor did they fear that posts could not be found for duly qualified men.

Throughout the proceedings Mr Tata sat silent, though before the deputation dispersed he took some part in an informal conversation. He was not disturbed

[1] *Report on the Research Institution in India (a provisional scheme).*

by Lord Curzon's questions. 'His Excellency made a very cautious reply,' said he, 'and many of our friends thought he was throwing cold water on the scheme. But I do not think there is reason to be discouraged. Lord Curzon was quite new to the country, and naturally, before paying a little close attention to the question, he did not like to commit himself.'[1]

Whatever his friends may have thought, Jamsetji Tata was far from losing faith in his scheme. He had received several unsolicited assurances of moral support, and he was confident, now the report was published, that the necessary help would be forthcoming. He relied largely upon the prospect of provincial contributions; the Imperial University of India would in time, he hoped, be able to extend its branches to different states. 'For instance,' said he, 'Baroda is an agricultural province, and that state might maintain an agricultural college. Mysore and Travancore, with their tea, coffee, chinchona, and gold might take up horticulture and mining.'[2]

When Mr Tata made these suggestions he was on a tour through Southern India. From time to time, partly for business and partly for pleasure, he enlarged his acquaintance with the industrial and historical features of his country. He was accompanied by two of his friends. From Mangalore they travelled in a coasting vessel down to Tellicherry, admiring the beautiful scenery of the Malabar coast. A stop was made at Mahe, for either there, or at Pondicherry, Mr Tata was contemplating the erection of a cotton mill.[3] Thence he and his companions went to Calicut, where the delightful surroundings tempted them to extend their stay. Mr Tata, who was never inactive, visited the principal factories, and expressed surprise that the spinning-mills were lying idle in a town where labour and material were so cheap. He was keenly interested

[1] *West Coast Spectator*, 9 February 1899. [2] ibid.

[3] See Chapter II, p. 38 n. Also Mr J. N. Tata to Mr Bezonji Dadabhai Mehta, 2 May 1900.

in the Botanical Gardens, for plants were one of his chief hobbies; and he was always anxious to obtain any rare specimens for his own little park at Navsari. From Calicut the party proceeded to Cochin; then to Travancore, that 'strange and romantic country', as Mr Tata called it. At length they went on to Bangalore.

During the journey special arrangements for their comfort had been made by Sir Sheshadri Iyer, who had assisted Mr Tata before. The meeting of the two men had an important bearing upon the future of the Institute. Ever since the subject was first broached Sir Sheshadri had taken a keen interest in Mr Tata's proposals. As early as 1895 he had suggested tentatively that Bangalore would prove a suitable site for the new foundation.[1] On this occasion Sir Sheshadri and his friend carried their plans a step further. Nothing definite, however, could be settled until a report had been made by some eminent man, and, at the time, one of England's best-known scientists was preparing to come out to India.

Meanwhile, the various sites proposed had been eagerly discussed. There were powerful arguments in favour of Bombay. On the whole, Mr Tata wished to ensure the connexion of the endowment with his own city. The industrial life, the wealth, the civic importance and the traditions of the place, marked it out as the proper town to act as trustee for the new foundation. But on a crowded island an area of 300 acres was not easily to be had, nor was proximity to the sea wholly suitable for machinery, books, and apparatus. An attempt was made to find an adjacent site. Within a few miles of the city the suburb of Trombay, 1,000 feet above the sea-level, might, it was thought, be made into an admirable centre of academic life. Mr Tata owned some property there, which he was prepared to put at the disposal of the Committee. The place, however, was somewhat inaccessible, for contrivances such as a ferry and a funicular railway would have been needed

[1] Sir Sheshadri Iyer to Mr Cook, 24 October 1895.

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if the University were to be brought within easy reach of the city. Such a project would have entailed vastly increased expenditure. In addition, as Trombay was outside the municipal area, the city could not authorize a contribution to the funds. The period of discussion was also one of distress: famine and plague were on the march, throwing a heavy burden upon the city's resources, and the consequent stagnation of trade forced the richer men to stay their hand.

These considerations brought Mr Tata back to his talks with Sir Sheshadri Iyer. While in Bangalore he received an offer which he could hardly be so ungracious as to refuse. The Maharajah of Mysore (one of the most advanced of the Indian states) had offered 300 acres of land in Bangalore, 5 lakhs of rupees towards the cost of building the Institute, and an annual subsidy of 1 lakh. This princely offer aroused a spirit of emulation in those who desired the people of Bombay to supplement Mr Tata's endowment. They marshalled their arguments against Bangalore. The town, though fairly accessible from Bombay and Madras, was considered somewhat remote for a great university, and it was not one of those towns in which wealthy men were so plentiful that a constant increase of subscriptions would be assured. It was felt that a university which was to be devoted chiefly to science and industry, should be situated where the civic life was fashioned to industrial needs, and where the right type of citizen could be obtained for service upon the governing body. Mr Tata, however, had no misgivings, and he was the one chiefly concerned. He welcomed the practical interest in his scheme, as it enabled his benefaction to be elaborated upon a proper scale. In addition, he regarded the agreeable climate of Bangalore as particularly suitable to the type of work he desired. His own associations with the place extended over several years, for he owned some property there, and on the Beggar Bush estate he had established one of his experimental fruit farms. There, too, some years before he had first made the acquaintance of Mr

Bhabha, the Inspector-General of Education, and their friendship had recently been cemented by a family tie, for in 1898 Mr Dorabji Tata married Mr Bhabha's daughter Meherbai, a Parsee lady, who had been educated on English lines, and had taken the fullest advantage of her opportunities both in study and sport.

It was some time before the Maharajah's offer was finally accepted, and the new foundation destined for Bangalore. Meanwhile, Mr Tata sounded all shades of educational opinion in India, inviting suggestions upon the provisional scheme.[1] These had, eventually, some bearing upon the final arrangements. Naturally there were those who wanted the Institute to teach every conceivable branch of science, but the criticisms, as a whole, were reasonable in scope. Some critics declared that the philosophical department appeared to 'entrench upon the legitimate functions of existing Universities'; that a beginning should be made with chemistry and technology; and that the 'development should be gradual and proportionate to the increase of the resources'. A few objections were raised to the title of 'Imperial University', though it was considered by many to be the most 'intelligible and attractive name'. In addition, a large university, with constituent colleges scattered throughout India, would have presented many practical difficulties in the working, especially in the constitution of a governing body, and the regular attendance of members for essential meetings. As to the site of the new foundation, at least half of the critics favoured Bombay; others were divided between Calcutta, Poona, Deolali, Nagpur, or places within their own particular province. Bangalore was the choice of but a few. A large number would have preferred a dispersal of the funds such as Mr Carnegie lavished on libraries; the provision of professorial chairs, laboratories, and libraries for the existing colleges, or a further endowment to enable research students to study under specialists, and to complete their work in Europe. This

[1] See *Abstract of Opinions*, etc. (25 April 1899).

plan, however, would have defeated Mr Tata's aims; he did not desire to interfere in any way with the existing universities; he wished to enable their graduates to continue a course which would give them a standing equivalent to a doctorate.[1]

Some months were occupied with the necessary spade-work; but within a space of time, shorter than the most sanguine had expected, the Government gave its official sanction to the initiation of the scheme. In October 1899, Mr Tata was invited to Simla to confer with Lord Curzon, who had already formed a high opinion of Mr Jamsetji's character, and esteemed his public spirit and generosity. The Viceroy called in the Chief Legal Adviser and the Directors of Education from the principal provinces. The outcome of the conference was a Government resolution expressing confidence 'that the proposed University will meet a great need, and will contribute to the advancement of higher education, and the development of the resources of the country'. A committee was authorized to collect the necessary funds, and the authorities at Bombay were requested to proceed with the arrangements for the transfer of Mr Tata's property and the business of endowment. Mr Tata's original suggestion was that he should set aside property worth 60 lakhs of rupees, half for the University, and half for his family, but the Government declined to undertake the administration of 'a private settlement in perpetuity'. When formal objection was made to the establishment of such a trust, Mr Tata, 'with as much good grace as public spirit, acceded to the wishes of the Government', making unconditional his offer of 30 lakhs of rupees for educational purposes. The property, which was annually increasing in value, was to be handed over 'free from any stipulation as to personal or family advantage'.[2] It was suggested that the foundation should be named the Tata University,

[1] *Report on the Research Institute in India (a provisional scheme).*

[2] *Memorandum on the Establishment of the Indian Institute of Science* (Simla, May 1909).

but with characteristic good judgement Mr Jamsetji refused to accept the proposal. He saw at once that if it bore his name, few people, if any, would subscribe to its further development, unless their own names appeared as joint benefactors.

At the close of the Conference there was some hope that the new foundation would quickly come into being. 'The Government,' said the resolution, 'will be ready to proceed to legislation as soon as the scheme has matured in all its details, and they wish the undertaking every success.' Mr Tata left Simla a happy man. Within fourteen months his provisional plans had been accepted, though, as a rule, such undertakings flowed at a sluggish pace through Government channels.

CHAPTER VII

THE INSTITUTE OF SCIENCE

II. COMPLETION

After the Simla Conference, the scheme, in all its essentials, remained as it had been drafted by the Provisional Committee, but the proposed title was changed to the ' Indian University of Research '. The Conference suggested that preference should be given to the scientific and technical sides, leaving the educational and philosophical branches in abeyance. Now that the Government's approval had been obtained, it was hoped that Bombay would respond, and her wealthier citizens would combine to supplement Mr Tata's princely donation. The Conference also approved of Bangalore as a suitable site. ' It now rests with Bombay,' said the *Times of India*, ' to say whether the Central Institution of the University shall be here, or whether the more than benevolent neutrality of the Simla Conference towards Bangalore should develop into a practical preference for that place.'[1]

For some time the results of the Conference revived the general interest in Mr Tata's benefaction. The Press was active in urging the Corporation of Bombay to establish the new university in their city, and tried to persuade other industrial magnates to subscribe their quota towards the necessary augmentation. Sir Sheshadri Iyer came from Mysore, and discussed the details of the scheme, without revealing what his own state was prepared to provide if Bangalore were not the site selected. After long discussion, the Corporation offered an annual sum of Rs30,000, though it was a matter for debate whether they could legally assist a university situated outside their actual boundaries. At

[1] *Times of India*, 23 November 1899.

the same time a private citizen, Mr Chabildas Lallubhoy, proposed to provide the necessary 300 acres on the island of Salsette, but the site was regarded as scarcely suitable.[1]

For several months no definite progress could be reported. Meanwhile, as it was Mr Tata's practice to visit every important exhibition, he spent the summer of 1900 in Europe. After visiting Paris he came to London, and saw Lord George Hamilton. Though the University of Research was discussed, Mr Tata's projects for the industrial expansion of India received equal attention.[2] While abroad, there was some misunderstanding with his friends over a suggestion which he had recently made. Mr Tata had in his mind a plan which would have increased the revenue of the Institute. So far he had consistently refused to receive any remuneration from the profits of the Empress Mills, though as their Managing Agent he was certainly entitled to do so. He now proposed to charge a small commission of 5 per cent and allot the proceeds to the revenue of his foundation. His proposal, however, aroused much discussion, even in the firm, and when Mr Tata was informed of these criticisms his fighting spirit was at once aroused. To his chief informant, he wrote somewhat brusquely: 'You say that I had better drop the scheme till the University scheme has gained greater strength. You say my friends will be glad if I do that; for no one who has come to know of it seems to like it, etc. Now what reason do the friends you speak of assign for the opinions they hold? I must confess that I am almost, if not quite, singular in all India, in not charging any commission. But that is my personal business if I choose to do so. . . . Nobody can say,' he continued, 'that the University scheme is not a grand and noble one, and the benefits to be derived from it infinitely great. Then why should honest people grudge me the right to claim what I believe is due to me, and

[1] *Bombay Gazette*, 14 March 1900. *Kaiser-i-Hind*, 8 April 1900.
[2] See Chapter VIII, p. 155.

make it over for such a noble cause? I can't see how even an ignorant man, except he be malicious, can misunderstand my motives.'[1]

In the end, however, Mr Tata listened to his friends, and abandoned the idea of taking a commission, even for so excellent a purpose. 'As far as reason and argument are concerned,' he wrote again, 'I cannot afford to ignore my friends' remonstrances, but when they come to impressions and sentiments, I do not see why my impressions and sentiments should give way to theirs.'[2]

While in London Mr Tata took the opportunity of seeing the man who put the whole scheme into practical shape. The Government of India had suggested that the project should be examined by a well-known scientist, a suggestion to which Mr Tata readily agreed. The Provisional Committee, on the advice of Mr Padshah, had selected the famous chemist, Professor William Ramsay, who at the end of 1900 proceeded to Bombay, and remained in India for over two months. While he was there, Mr Tata bore the whole expense of his visit, paid him a handsome fee, and extended to him the most cordial hospitality.

Within three months Professor Ramsay issued his report. Though he agreed with Lord Curzon as to the insufficiency of scientific posts for graduates, he believed that it was possible to create new industries and to reform the old. The resultant expansion of Indian industry would, he thought, provide work for scientists in every grade of the business world. He quoted certain industries which could be developed to India's advantage, and would thus provide outlets for the employment of a number of trained men.

After visiting all the places proposed for the site of the foundation, Professor Ramsay decided that Bangalore was the most suitable town. 'The state of Mysore,' said he, 'is rich in mineral products; it contains large deposits of pure iron ore; the Kolar goldfields—I

[1] Mr Tata to Mr Bezonji Dadabhai Mehta, 2 May 1900.

[2] ibid., 19 June 1900.

imagine the largest industry in India—are on its borders.' He proceeded to enumerate the rich veins of various ores, and pointed out that the sugar-cane and opium-poppy both grew in the district. He also regarded the climate of Bangalore as suitable for Indians and Europeans alike. He was perhaps disposed to exaggerate the industrial potentialities of a hydro-electric scheme, worked from the Cauvery Falls, which he thought would enable the city to become one of the largest owners of power in the world, with a consequent development of its manufacture. As far as the spirit of the town was concerned the Professor found 'a certain nucleus of scientific society', congenial to the staff and the students. For the initial composition of the staff, he recommended a professor of engineering technology, a professor of industrial bacteriology, and a lecturer in physics, all of whom should be provided with suitable assistants. He also advised arrangements by which each professor would have an extended vacation in which to continue his researches, and he suggested that no restrictions should be placed upon their powers to act in a consultative capacity for the benefit of industry. The report also recommended the employment of mechanics and electricians, who could make the apparatus and teach the students to use their own hands.

In addition to the recommendations which dealt with the general organization of the work, Professor Ramsay's report defined the relation of Mr Tata's benefaction to the educational system of India. He rejected the title of University, and the nomenclature associated with a corporate body of that standing. 'Such work as is here proposed,' he wrote, 'is not, so far as I am aware, carried on at any University. . . . It is not 'universal' . . . i.e., it does not cover research in all branches of knowledge, at least at present.' In India, as he said, the title had not only the disadvantage of association with purely examining bodies, but was likely to arouse a certain amount of jealousy.

It was finally decided that the new foundation should

be named the 'Indian Institute of Science'. Though both Mr Tata and Mr Padshah had originally set their heart upon the title and standing of a University, they recognized those arguments which favoured the change. But while it seemed that the scope of the benefaction was thereby somewhat narrowed, Professor Ramsay suggested future developments for the furtherance of post-graduate work in other branches. During his stay in India he was in constant touch with Mr Jamsetji, who enabled him to meet several learned Indians. By them he was assured that a certain number of Orientalists, well versed in the languages, literature, and antiquities of India, would be prepared to devote their means and their leisure to the advancement of oriental studies. This was exactly what Mr Tata desired. Though prospects of the fulfilment of such an expansion were somewhat remote, Professor Ramsay concluded his report with the hope that a 'literary laboratory', and a proper complement of manuscripts and books, would eventually be founded in connexion with the Institute.[1]

While Professor Ramsay was still in India a suggested diversion of policy was brought forward by a few of Mr Tata's friends, who desired that his benefaction should be merged in the general fund for a memorial to Queen Victoria. Apparently Mr Tata gave his personal consent to an amalgamation of his endowment with the Memorial Fund.[2] He had been supremely patient during four years of negotiation, tinged at times with disappointment. He no longer felt himself a young man, and wished to see the Institute established during his life-time. Meanwhile he had other tasks; and he therefore welcomed any proposition which promised to quicken his educational scheme into life. The general enthusiasm had been somewhat damped down by the Viceroy's statement that the endowment 'would benefit but a small number of persons out of a

[1] *The Indian University of Research.* Report by Sir William Ramsay, Ph.D., F.R.S., etc. (Bombay, n.d.).

[2] *The Champion*, 3 March 1901.

population of even a province or district '.[1] Mr Tata was then advised to withdraw his offer.[2]

Though somewhat impatient at the tardy progress, Mr Tata's practical mind, coupled with his faith in the work, would not permit him to abandon the project, but he was compelled to endure further delays. The publication of the Ramsay Report revived the discussion upon the scope of the endowment. In Bengal there were some complaints that the Professor had cast so decided a vote in favour of Bangalore, a town which the Hindu deemed to be somewhat remote, and devoid of intellectual society. It was stated that both Mr Tata and Mr Padshah were in favour of Calcutta, though Mr Tata had already informed the Mysore Government of his preference for their capital.[3] The Government of India, with a view to retrenchment, wished to see if a scheme could not be framed that would involve the expenditure of an annual sum less than that which Professor Ramsay had estimated, and they suggested the appointment of a further committee to revise and report in the matter. Colonel Clibborn, of the Roorki Engineering College, and Professor Masson,[4] of Melbourne University, who were appointed to make the necessary investigations, considered that the Institute could be worked on an income of a little over one and a half lakhs of rupees, which was about half that suggested by Professor Ramsay. In their report the Committee moreover suggested Roorki as a more suitable centre than Bangalore.[5]

Whatever claims to consideration this town may have possessed, it was not associated with anyone prepared to assist by a grant of money. The only firm offer was that made by the Government of Mysore, though after the death of Sir Sheshadri Iyer the original offer of a lakh of rupees was reduced to Rs30,000. This reduction

[1] *Times of India*, 13 March 1901.
[2] *The Hindu*, 7 March 1901. *The Bengali*, 4 April 1901.
[3] *The Bengali*, 9 April 1901.
[4] Afterwards Sir David Orme Masson.
[5] The report is dated 5 December 1901.

was proposed at the instance of the Viceroy, who still regarded the whole scheme as too elaborate. The possibilities of substantial assistance from Mysore had influenced Professor Ramsay's choice of a site. To him finance was the key to the whole situation. In his opinion it was folly to launch the scheme unless its financial future were assured. 'I do not think,' he wrote, 'it would be of much use to start with less than an income of 210,000 rupees.' Mr Tata had himself guaranteed an income of more than half that sum, and had the Clibborn Report been accepted, he would have found most of the money out of his own purse. His adviser not only wanted a Government grant, but regarded it essential that the Committee should endeavour to obtain a considerable addition to Mr Tata's donation. If these were not forthcoming Professor Ramsay thought that Mr Tata would be well advised to 'withdraw his offer, and to attempt to establish manufactures privately, and at his own risk, and drawing the returns which the successful establishment of these will undoubtedly yield'.[1]

Despite the uncertainties of further financial support, Mr Tata had no desire to take such advice. His object was to benefit his country—even if somewhat aggrieved, he was not discouraged either by the apparent apathy of the Government or the wavering of the public. He recognized facts, and could see that further contributions were hardly to be expected. His mind, however, was somewhat troubled over the Government's attitude. Even with the generous offer from Mysore, there was not a sufficient guarantee that the endowment could be placed on the sound financial basis recommended by Professor Ramsay, and the Government had hitherto not come forward with an offer of sufficient funds to ensure stability on such a scale.

Their hesitation to do so was no doubt due to the revision of their educational policy. Shortly after Lord Curzon became Viceroy he instituted an inquiry into the whole educational system of India, from primary

[1] Professor Ramsay's Report, p. 27.

school to university. In September 1901, some months after Professor Ramsay had left India, a conference was held, when the results of the inquiry were discussed, and the resolutions were embodied in a series of general orders. It was decided that the future of the universities, as well as of the European and industrial schools, should be made the subject of a further report.[1]

Without the requisite assistance from the Indian Government little more could be done. Had the Institute of Science been Mr Tata's sole preoccupation, he would have chafed at these ungracious delays. But his manifold activities enabled him to preserve a well-balanced attitude. The projected Steel Works, the Taj Mahal Hotel, and the Hydro-Electric Project were all at various stages of incubation. Mr Tata had to look after these interests and to make, in this connexion, certain purchases and investigations outside India.

During his absence he left the guidance of the educational scheme to the care of his elder son and Mr Padshah. In May 1902, he set out for Europe and America. He was somewhat reluctant to leave home, for Mrs Tata's health was causing him great anxiety, but he committed her to the charge of his two sons, and Dr Row, in whom he had the fullest confidence. From Trieste he proceeded to Paris, where he met his cousin Ratanji. For some time past Mr R. D. Tata had presided over a further branch of Tata and Company, which his firm had established in Paris, trading chiefly in pearls, and in silks that were stored at Lyons. He chose as his wife a French lady, who embraced the Zoroastrian faith, and adopted Parsee customs and dress. The marriage took place while the head of the family was in France.

Mr Jamsetji then went on to London, where he was able to devote his spare time to the furtherance of the educational project. Sir William Ramsay had been made a K.C.B., and he and Lady Ramsay arranged a small dinner party, at which Mr Tata met Colonel

[1] *Report on the Progress of Education in India* (H.M. Stationery Office, Cd. 4635).

Clibborn and Mr Justice Candy, who, as Chairman of the Provisional Committee and Vice-Chancellor of the University of Bombay, had taken an active interest in the scheme. 'We discussed the subject thoroughly,' wrote Mr Tata to his son, 'and the conclusion we came to was to hold the matter in abeyance for a little while. I have also had a short interview with Mr Ritchie.[1] He was very sympathetic, and has asked me to see him now and then. They are all very busy at the India Office owing to the Coronation festivities, and Ritchie says there will be no chance of a good long talk with Lord George until after the first week in July. . . . The best thing to do is to wait till he is more free and has plenty of leisure, and then have a long and comprehensive interview with him.'[2]

Shortly after deciding to suspend the scheme, Mr Tata left London. After a short holiday at Karlsbad he proceeded to Düsseldorf, where he visited the great Industrial Exhibition, by which Germany showed the rapid progress she had made in iron, steel, and electricity. He was accompanied by the contractor for electrifying the Taj Mahal Hotel. 'We are all surprised,' he wrote, 'at the superiority and cheapness of all German machines and articles, as compared to English.'[3] Indeed, had Mr Tata needed an object lesson in order to emphasize the importance of the Institute, he received it in Düsseldorf. The application of science to industry was apparent on every hand. It was therefore the more disheartening that his munificent proposal had still to be laid aside.

When he returned to London Mr Tata was unable to see Lord Reay, but had a brief interview with Lord George Hamilton. Sir William Ramsay was awaiting an answer to a letter which he had written to Lord Curzon, and could give no further advice until he

[1] Afterwards Sir Richmond Ritchie, Permanent Under-Secretary at the India Office.

[2] Mr J. N. Tata to Mr D. J. Tata, 20 June 1902.

[3] Mr J. N. Tata to Mr D. J. Tata, 5 September 1902.

had received the reply.[1] In London nothing could be done, and Mr Tata was obliged to sail for America without any definite assurance from the Government as to the future of the Institute. His time in the U.S.A. was fully occupied by arrangements for the projected steel works, and he wrote again to his son, advising the suspension of the educational scheme.[2]

On his return to India matters slowly mended. Early in 1903 Lord George Hamilton informed the House of Commons that the scheme was still in abeyance, though he declined to publish the correspondence upon the subject.[3] But it is evident that pressure from the India Office quickened the Indian Government into action. In May they announced that they were prepared to make a grant of £2,000 a year towards the Institute, to supplement the subsidy given by the Mysore Durbar.[4] In order to avoid the cumbrous method of special legislation they requested Mr Tata and his advisers to expedite the transfer of the property to the Treasurer of Charitable Endowments, a more flexible method for the completion of the necessary legal formalities.[5]

The outlook at this stage was far more hopeful, but Mr Tata did not live to see the full realization of his plans. At the time of his death he was still in doubt as to whether his ambitious schemes were secure. He felt, however, that his work would not be wasted; and, though his sons were not in any way bound by their father's will, they at once announced their intention of devoting the requisite share of their heritage to the Institute and of carrying out their father's wishes to the full. Soon after Mr Jamsetji's funeral, Mr Dorabji Tata was advised by Lord Reay to see Lord Curzon,

[1] Mr J. N. Tata to Mr D. J. Tata, 18 September 1902.

[2] Mr J. N. Tata to Mr D. J. Tata, 19 October 1902.

[3] Parliamentary Reports.

[4] i.e., £2,000 at Rs15 to the pound = Rs30,000.

[5] *The Times*, 27 May 1903. See also Sir Dorabji Tata's speech at the laying of the foundation stone (*Times of India*, 2 February 1911).

who was then in England. During an interview at Bexhill the matter was once again fully discussed. Mr Dorabji stated the terms upon which he and his brother were prepared to endow the Institute with the full amount contemplated by their father. Failing adequate assistance from the Government, they had decided to withdraw the offer, and to utilize the money in some other way, for the benefit of education in their own country. Lord Curzon promised to reconsider the whole project on his return to India, and arranged to see Mr Dorabji as soon as he landed. A Conference was held at Calcutta, with Sir Herbert Risley, the Home Secretary, where the full details of the scheme were at length settled. The Government of India accepted the minimum scale laid down by Sir William Ramsay, recognizing that a smaller Institute of the type suggested by the Clibborn-Masson Committee would have been hardly worth the establishment. In accordance with the arrangements made at Bexhill, the Government agreed to give a grant-in-aid to the extent of half the amount collected from all other sources, both for capital and recurring expenditure, and waived their original limitation of the proposed grant to ten years.

The legal formalities caused some delay, but within two years it was possible to proceed with the appointment of the staff, who were selected by a Committee of the Royal Society. In 1906 the first Director sailed for India to assist in the organization of the Institute, and to advise on the buildings and equipment. The Committee had chosen one of their Fellows, Dr. Morris Travers, a scientist who had been closely associated with Sir William Ramsay in some of his most important experimental work. Soon after Dr Travers arrived, the task of framing the constitution was taken in hand, and, after prolonged consultation with the donors, a general agreement was reached. To complete the arrangements a Government resolution was issued describing the scheme, and detailing the assistance that was to be rendered by them and by the Government of

Mysore. Till that time the Government of Mysore had agreed to provide annually Rs30,000, but they were ultimately persuaded to raise their grant to Rs50,000 a a year. The annual income of the Institute (Rs2,62,500) was thus made up of Rs1,25,000 from Mr Tata's two sons, Rs50,000 from the Mysore Durbar, and Rs87,500 from the Government of India. The Mysore Durbar also contributed a further Rs5 lakhs towards the capital expenditure, and the Government of India added Rupees two and a half lakhs in accordance with their promise of a grant-in-aid.

The Provisional Committee had only limited powers, but once the constitution was ready and approved by the new Viceroy, Lord Minto, as Patron, the necessary Vesting Order was signed on 27 May 1909, and the Council, which shortly afterwards came into existence, took in hand the construction and equipment of the buildings. Early in 1911 the Maharajah of Mysore laid the foundation stone of the Institute, and on 24 July the first students were admitted to the Department of General and Applied Chemistry under Mr Norman Rudolf, and Electro-Technology under Dr Alfred Hay. Within two months the Department of Organic Chemistry was opened, and the students' quarters, and bungalows for the staff, were ready for occupation.

Those who began work, found that their lot was cast in pleasant places. The buildings, which are distributed over a large area, stand high above the sea-level, and look over one of the most beautiful tracts of undulating country in Southern India. The architecture of the central building, which is used as a library and senate hall, is in the classical style, carried out in grey granite, and is crowned by a handsome tower 160 feet in height. Near the main entrance stands a noble monument, the work of Mr Gilbert Bayes. One relief contains the figure of Jove, with his thunderbolts to typify electricity, and Vulcan with his anvil, ready for the steel; in the other, Minerva holds a distaff covered with flax, and Calliope represents research. A bronze

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rail has as its centre a lamp of learning, flanked by dolphins to symbolize the founder's travels. Abundance at one side, and Knowledge at the other, support the centre shaft. At its summit is a bronze statue of the benefactor, and at his feet is an inscription, which will serve to remind future generations of the generosity of Jamsetji Tata, and the persistence with which he worked for the welfare of India.[1]

[1] *The inscription reads:*

JAMSETJI NUSSERVANJI TATA
PARSI CITIZEN OF BOMBAY
BORN MARCH 3, 1839
DIED MAY 19, 1904
TO HIS FORESIGHT AND PATRIOTISM
THE INDIAN INSTITUTE OF SCIENCE BANGALORE OWES ITS ORIGIN
AND TO HIS MUNIFICENCE
A GREAT PART OF ITS ENDOWMENT
AS A DISTINGUISHED CAPTAIN OF INDUSTRY AND PATRON OF LEARNING
HE PERCEIVED THE BENEFITS
TO HIS COUNTRY
OF ADVANCED RESEARCH IN SCIENCE, ARTS AND INDUSTRIES
AND FOUNDED THIS INSTITUTE
THE FIRST OF ITS KIND IN INDIA
THIS STATUE OF ITS FOUNDER WAS ERECTED IN 1916
BY THE COUNCIL OF THE INDIAN INSTITUTE OF SCIENCE

CHAPTER VIII

IRON AND STEEL: PRELIMINARY INVESTIGATIONS

1882

In telling the story of Jamsetji Tata's achievements, it is a matter of some difficulty to deal, in adequate fashion, with the schemes which he initiated but left to others to complete. He was one whose work lived after him in such a way that it is well-nigh impossible to draw a dividing line between conception and maturity. The tributes paid to his memory always show how much the influence of the dead strengthened and inspired the deeds of the living. The two greatest enterprises of the firm—the Iron and Steel Works and the Hydro-Electric project—were both fostered by ambitions which crossed his mind while a comparatively young man; it was he who obtained the interest of the Imperial Government in both schemes. Neither paid a penny-piece during his life-time, and he financed all the preliminary investigations. Though in later years he left the active work to others, his name is inseparably connected with the town of Jamshedpur and the great reservoirs upon the Western Ghats.[1]

The art of smelting and fashioning iron is believed to have been known in Asia, the oldest home of civilization, long before it reached Europe. The Chinese, who did most things earlier than the other races of the world, are sometimes said to have been the first workers

[1] From this point onwards the two succeeding chapters were written by Mr Lovat Fraser as part of his proposed biography of Mr Tata. They have already been published in a separate volume (*Iron and Steel in India*, Bombay, 1919). A few passages have here been omitted, a few verbal alterations have been made for purposes of the narrative, and the spelling of proper names has been made uniform with the spelling in other chapters of this biography.

in iron. Through them, India is thought to have learned how to smelt and to forge. From India came the first supplies of those weapons which figure in the earliest recorded and half-mythological history of the peoples of the Mediterranean. The views of experts on this subject are curiously conflicting. On the one hand, we are told that it is a proof of the lack of mechanical inventive genius in India that, in spite of the early familiarity of her people with the iron industry, they never developed it beyond certain primitive stages. On the other hand, we are sometimes assured that India did, in early times, reach a very high stage of proficiency in metal manufactures. The truth probably lies midway between these two opposing forms of statement. If, as the late Mr Syed Ali Bilgrami stated, the steel from which Damascus blades were made came from Hyderabad, it is reasonable to assume that Indian workers in metal were at least highly competent in the Middle Ages. An earlier example of Indian skill in casting metals is found in the famous iron column at the Kutab Minar, near Delhi. The column is estimated to be three thousand years old, and it represents a forging which weighs between seven and eight tons. To this day, the method by which it was produced is a mystery greater than the building of the Pyramids. That the steel known as *wootz* produced in Hyderabad was not solely used for the purposes of export is sufficiently proved by the wonderful collections of ancient arms still found in India. Many of the weapons are of very great antiquity, and show remarkable qualities of workmanship. The art of damascening upon soft steel was widely practised in India, chiefly in connexion with arms. It was only after the downfall of Sikh independence in the last century that it almost ceased to be associated with the manufacture of swords and armour, and was thereafter employed only in the adornment of more peaceful products.

Of the antiquity of the iron and steel industry in India there is, therefore, no doubt. The high degree of skill attained in certain directions has also been

abundantly proved. Yet it is equally true that the Indian metal manufacturers never overcame certain definite limitations, and showed little tendency to progress. The vast heaps of slag found at Wai in the Western Ghats and in several other places indicate the extent of the industry. The pitiful and laborious methods adopted may still be seen in use in India to-day. The village worker in iron smelts his ore with the aid of a wooden bellows, handled by his assistants exactly as his forefathers did in the days when Alexander the Great raided the Punjab. He knows no better method, nor does he seek to know one. The failure to progress need not fill us with surprise. Even in Europe the use of iron upon a widespread scale has been comparatively modern. The extensive production of iron in England really only dates from the seventeenth century, and the methods of manufacture remained crude until the eighteenth century was well advanced. The basic process of eliminating phosphorus from iron, out of which the largest steel industries of Europe and America have grown, was only discovered so recently as 1878. That Indian metal workers in iron got no further than the export of large quantities of *wootz* steel and the fashioning of splendid weapons was due to the fact that the scientific age in Europe left them untouched. When British rule was being established throughout India, the newcomers depended for their supplies of metals chiefly upon imports. The introduction of railways dealt a death-blow to the indigenous industry, because cheap imported iron and steel was carried everywhere, and the Indian craftsmen soon found their occupation gone. The primitive smelting industry still lingers in some districts, and is even said to have shown slight signs of revival, but it must unquestionably disappear. The modern encouragement of technical education and the influence of schools of art should, however, help very much to revive the more artistic side of metal working.

In the year 1899, General (then Major) R. H. Mahon, an artillery officer who had been Superintendent of

the Government Ordnance Factories at Cossipore, issued a memorable report upon the manufacture of iron and steel in India. In the previous year there had been a great revival in the iron trade throughout the world, and Major Mahon declared that the time had arrived for India to establish iron and steel works 'on a considerable scale'. He began by insisting that it was useless to attempt to produce charcoal iron in large quantities. Coal, the production of which was just beginning to increase greatly in India, must be the fuel used; and it says much for his foresight that he not only indicated Bengal coal as the only source of supply capable of being efficiently transformed into coke for blast furnaces, but suggested that the Jherria coal-field would furnish the largest supply of coal of the requisite quality. When Major Mahon turned to discuss the sources of supply of iron ore and limestone, he was on less sure ground, because at that time the available information was extremely incomplete. He thought that limestone would probably have to be brought from Burma, where, on the Arakan coast, there are inexhaustible supplies; but he was cautious enough to add that there was 'little doubt that the creation of a demand for pure limestone will be followed by the discovery of fresh supplies of this not uncommon rock'. As to iron ore, he selected three areas as probably suitable for his purpose—the Salem mines in Madras, the Chanda mines in Central India, and the mines in the Bengal area. Of the Bengal mines he said, however, that 'it is open to the gravest question whether any brand of pig-iron suitable for subsequent working into steel of high quality could be made on a large scale from Bengal ore alone'. He further observed that 'although the ores of Bengal are spread over a wide area, examinations of these have not so far shown that any one site or even any one neighbourhood would yield a sufficient output to supply the needs of a large works'. On both these points Major Mahon was wrong, but he cannot therefore be criticized. He was not a prospector, but was writing

upon such data as were then accessible, and his conclusions were in accord with the scanty facts then known. The genius and stubborn perseverance of Jamsetji Tata and his successors were to prove in a few years that, within the boundaries of the old province of Bengal, iron ore of the finest quality existed in unlimited quantities; and they were further destined to discover a huge supply of excellent flux for blast furnaces without going overseas to Burma.

In other respects General Mahon's report was almost prophetic. He contended that Calcutta or its neighbourhood would be the best site for iron and steel works, and he laid down three principles which should guide the promoters of such an enterprise. The first was that the plant of the works must be thoroughly modern in every detail; the second, that the management should consist of persons 'combining expert knowledge with local experience'; and the third, that economy in collecting and assembling the raw material would have to be insisted upon in order to secure a return upon initial outlay. All these conditions were duly fulfilled when General Mahon's dream of a great iron and steel works for India was realized.

For another, and an even more practical dreamer, was already shaping in his mind the great scheme which was to provide India with a huge iron and steel works of the most modern kind. The idea of utilizing upon the largest possible scale the iron deposits of India had simmered in the mind of Mr Tata for very many years. In 1882, when he was still spending much of his time at Nagpur and supervising the Empress Mills, he chanced to see a document which had just been issued by the Government. It was a 'Report on the financial prospects of iron-working in the Chanda district', by Ritter von Schwarz, a German expert, who then, and for many years afterwards, was frequently employed by the authorities in investigating the iron and coal deposits in India. Von Schwarz was not the first inquirer who had examined the Chanda district. Mr

Bauermann had visited the field in 1873, and others had followed him. Von Schwarz stated that the most important and the best situated deposits of iron ore in the Chanda district were the specular ore at Lohara and the magnetite at Peepulgaon. 'Each of these deposits,' he said, 'forms a continuous accumulation of compact iron ore.' He was apparently the first to announce the existence of the afterwards famous 'hill of iron' at Lohara, and he gave its dimensions as three-eighths of a mile long, 200 yards broad, and 100 to 120 feet high. He further said that the coal of the adjacent Warora district was only good enough for the 'refining process, namely, the conversion of the pig-iron into finished iron and steel'. Von Schwarz seems never to have contemplated the smelting of the ore otherwise than by charcoal. He pointed out that fuel could only be obtained from the forests within a 20-mile radius, that the utmost yield of charcoal would be 32,000 tons yearly, and that the output of iron would therefore be approximately limited to that quantity, allowing one ton of charcoal for each ton of pig.

Mr Tata's active mind was fired by his perusal of the report of von Schwarz. It is believed that he visited Lohara, a name which may be freely translated as meaning 'the place where iron is found'. There are five or six Loharas in the Central Provinces. He was not satisfied with the conclusion of von Schwarz that the Warora coal would not coke sufficiently well to smelt iron ore. He had the coal analysed—the Warora mine is now closed, but was worked by the State until 1906—and at a later date he took specimens to England, where coking trials were made with no very satisfactory result. He thereupon advertised in various technical journals, offering a reward to anyone who could devise a method of smelting the Lohara ore with Warora coke. Although no completely suitable method was found, some of the answers contained suggestions which Mr Tata considered useful, and eventually he divided the reward between several persons. On his return to India he went to Sir John

Henry Morris, the able administrator, who had then for fifteen years been Chief Commissioner of the Central Provinces. He asked for a concession to work the Lohara ore deposits with the Warora coal. His intention was, he said, to form a Company, and he further requested that the branch railway from Wardha Junction to Warora might be placed under the control of the proposed Company. One can imagine that Sir John Morris was a little breathless when confronted with this sweeping proposal. He and Mr Tata had always been good friends, and he had deeply appreciated Mr Tata's services in developing a great industry at Nagpur; but in those days the Government still looked suspiciously upon mining projects and all that pertained thereto. The unfortunate exclamation of Lord Lawrence: 'I know what private enterprise means! It means robbing the Government!' still defined the spirit in which the authorities contemplated schemes for tapping the country's unutilized resources. Sir John Morris was not unfavourable, but he was helpless. The Warora line was worked as a branch of the Great Indian Peninsula Railway, and was 45 miles long. The Government thought a great deal about the strategic value of railways and very little of their commercial uses. They could not contemplate handing over their coal mine, and the railway line leading to it, to private control. Mr Tata, on his part, was unwilling to pursue his scheme unless he had control of the means of transportation to the trunk line. It was therefore dropped, and for many years nothing more was heard of the Chanda iron deposits. The time was to come, long afterwards, when the Government of India were to spend over a quarter of a million sterling in building forty miles of new railway to assist the iron and steel works.

One obstacle which for a long time cooled the active interest of Mr Tata in iron and steel projects was the absurdity of the Indian regulations for mining and prospecting, which seemed carefully devised to obstruct and prevent development. It was not until 1899 that

investigators were released from the antiquated chains in which they were bound. This question is dealt with in another work.[1]

'In his first year in India (1899),' says Mr Fraser, 'Lord Curzon issued revised rules for mining and prospecting; I believe the question had been under consideration before his advent. The extraordinarily obstructive and unjust rules previously in force are scarcely conceivable today, but they illustrate very forcibly what I have already said about the former attitude of the Government of India towards private enterprise. One ridiculous rule was that no prospecting licence could be granted to a company or syndicate, although mining enterprises are usually entered upon by associations rather than by individuals. The framers of the original rules seem to have been inflamed by an almost inexplicable intolerance of companies and syndicates. Again, even a prospector for coal was limited to an area of four square miles, and it was further directed that at least eight miles must intervene between any two prospecting grants to the same person! Prospecting for coal is sometimes an elaborate business, involving heavy initial outlay, and such a rule was almost prohibitive. A disgracefully unjust rule was that 'when any area has been explored and its value as a field for mining is sufficiently ascertained', provincial Governments were empowered to refuse to grant prospecting licences, and to put up the whole of the mining rights for sale by auction. It is hardly possible to estimate all the mischief that single enactment did in retarding the development of the mineral resources of India. By its provisions the Government, after permitting an individual to undertake the arduous work of exploration, were enabled to step in, regardless of the preferential claim established by the explorer's industry and enterprise, and sell to any competitor all the mineral wealth he had revealed. A Chinese mandarin of the old school would hardly have been capable of more shameless

[1] Lovat Fraser, *India under Curzon and After*.

injustice. A ludicrous regulation was that when premises and mines were abandoned, the workings had to be handed over to the Government "in a workmanlike state". Even an exhausted coal seam had to be delivered up "in a proper state for working" if the rules were insisted on.

'The old mining rules were by no means a case apart; they were simply a fair illustration of the normal demeanour of the Government towards business men for a period of half a century. The changes made in them by Lord Curzon were the first fruits of the new policy by which he instilled confidence into every branch of commercial life. All the regulations I have quoted were ruthlessly destroyed: royalties on precious stones and gold and silver were based on net profits instead of on output, and thus an iniquitous provision which had cost the Burma Ruby Mines Company £150,000 while it was working at a loss was abolished; the royalty on coal was reduced from 2d. to 1d. per ton; an absurd prohibition controlling the assignment of interests was excised from the rules, and in many other ways the whole of the conditions were revised.

'The reform gave a great impetus to mining enterprise in India. Sir Thomas Holland, in a lecture to the Royal Society of Arts in April 1911, pointed out that the year 1899 was memorable in regard to mineral questions, in two ways. In that year not only were the new mining rules promulgated, but a gold standard of currency with a fixed rate of exchange was adopted. English investors knew for the first time the exact nominal value of their outlay and the worth of their dividends. . . . Certain flaws in the new rules have now been rectified; but after ten years' working Sir Thomas Holland was able to testify to "the generous nature of the rules as a whole".'

Mr Tata had never abandoned his hopes of developing the mineral resources of India. The copious cutting-books which he kept show that for years nothing published about Indian minerals had escaped his watchful eye.

He was a great reader of newspapers, but always with special regard to the questions in which he was deeply interested. He saw General Mahon's Report as soon as it appeared in 1899; and when in the same year the mining and prospecting regulations were revised, his mind turned with revived activity to his schemes of long ago.

In the summer of 1900, Mr Tata, while in England, saw Lord George Hamilton on the question of a family settlement in connexion with the Institute of Science, which he proposed to endow. The conversation passed to the question of the cotton excise duties. In illustration of his contention that industrial enterprise in India was often thwarted by official opposition, Mr Tata related to Lord George the story of his attempts to found an iron and steel industry twenty years earlier.

The services of Lord George Hamilton to India have never been sufficiently realized. He was for four years Under-Secretary for India, and for seven years Secretary of State. No other English statesman except Sir Charles Wood (afterwards Viscount Halifax) has been associated with the administration of India for so long a period. Lord George Hamilton was always ready to give a sympathetic ear to schemes for the advancement of India, as many Indian visitors to England have had occasion to know; and he instantly urged Mr Tata to revert once more to his scheme for an iron and steel industry. His great desire, he said, was to see Indian industries developed with Indian capital; and he added that from what he had heard he felt assured that in Mr Tata the Government of India had found the man they had been looking for. Lord George expressed surprise, and a little incredulity, at Mr Tata's roseate accounts of the rich deposits of iron in India. Even if he had seen General Mahon's Report, he had not fully realized that the prospects of establishing a successful iron and steel industry on an extensive scale were as hopeful as Mr Tata seemed to think. Mr Tata explained that there were other confirmatory reports, and at the request of Lord George he telegraphed to Bombay for these documents.

Even the forgotten report of von Schwarz was rescued from some dusty pigeon-hole for the Secretary of State's perusal. Mr Tata was moved by the cordiality of his reception to explain to the Secretary of State not only his hopes, but his fears, for the success of his scheme. He was twenty years older, he said, than he was in the days when he first turned his attention to the Chanda deposits. At that time he was ambitious, he had his way to make in the world. Now God had given him enough and to spare, and there was no reason why he should go on, save only his deep concern for the better welfare of India. He was afraid that, if he persevered in his enterprise, he might meet with rebuffs from officials. Lord George replied that Lord Curzon would assuredly help him. What better backing could he desire than the support of the Viceroy? Mr Tata's answer was that Viceroys come and go, and that before his scheme took final shape he might find himself dealing with strangers who would treat him with indifference. He knew his India. The Secretary of State reassured him, strongly urged him to proceed with his task as a duty he owed to his country, and promised to authorize the Government of India to give him all possible help. The promise was faithfully fulfilled. Lord George wrote to India expressing the warmest interest in the project, and signifying that any steps the Government of India might take to assist it would receive his ready endorsement. From that time onward Mr Tata and his successors never had much reason to complain of any lack of official support.

Those unfamiliar with the British system of controlling India may wonder why it was imperatively necessary to interest the Secretary of State in the scheme. India had a Viceroy and an Executive Government on the spot. Why, it may be asked, should London be consulted? The answer is that the India Office exercises a constant supervision over the executive acts of the Government of India. The scrutiny is especially close in cases of expenditure of an unusual character. Help to Mr Tata meant, in the long run, expenditure in unusual directions.

Unless the interest of the Secretary of State and his advisers had been urgently solicited, the proposed outlay might have been disallowed.

On his return to India, Mr Tata applied for prospecting licences for the Lohara and Peepulgaon areas in the Chanda district. His applications were favourably received by Sir Andrew Fraser, who had become Chief Commissioner of the Central Provinces. Sir Benjamin Robertson, then Chief Secretary to the Central Provinces Government, also gave him much encouragement. Through these applications Lord Curzon and Sir Edward Law, then Minister of Finance, became aware of Mr Tata's schemes. The mistake he made at this stage was that the work of prospecting was placed in the hands of agents with insufficient experience, and for a long time there were no very definite results. By writing letters to Sir Richmond Ritchie he kept Lord George Hamilton acquainted with what he was doing, in fulfilment of a promise made when in London. His methods were leisurely, and he had no intention of rushing with insufficient inquiry into a great scheme. At Nagpur and Simla it was thought that he was too leisurely, but he would not be hurried.

Mr Tata left India once more at the beginning of May 1902, in the Austrian Lloyd Steamer *Imperatrix*, and reached Trieste on 17 May. He stopped for a couple of days in Paris, and on reaching London saw Sir Richmond Ritchie at the India Office. He sought another interview with the Secretary of State, partly regarding the Research Institute, though he was also anxious to discuss his iron scheme once more. In a letter dated 20 June he says that he found Sir Richmond Ritchie 'very sympathetic'; but much to his disappointment he was told that there would be 'no chance of a good long talk with Lord George Hamilton' until the Coronation festivities were over. On 4 July, in a postscript to a letter to Mr Dorabji Tata, he says:

'As regards our iron and coal business, I am sorry nothing has been and can be done yet. Everybody

seems to be absorbed in something of his own. But from next week the Secretary of State has promised to attend to the matter.'

The promise does not seem to have been immediately fulfilled, for Secretaries of State are very busy Ministers. When Mr Tata wrote again from London on 1 August, the promised interview had not been given. Repeating his action of a couple of decades earlier, he had once more brought to England various samples of Central Provinces coal. Regarding these, he says, in a letter to Mr Bezonji Dadabhai Mehta:

'As regards the coking of coal I am having experiments made in Germany and America. I am going to Germany next week, and will see to the matter. In America I have been promised every assistance by Sir Clinton Dawkins, through his firm of Pierpont Morgan in New York. So far the results of the trials are fairly satisfactory.'

Sir Clinton Dawkins had been Finance Minister in India, and must have been well acquainted with Mr Tata and his work. Mr Tata spent the greater part of August at Karlsbad, and at the beginning of September went to Düsseldorf, where he saw the Exhibition and attended the Congress of the British Iron and Steel Institute. He then returned to London, and on 18 September wrote thus to his son:

'I am sorry I have not been able to see either the Secretary of State or Lord Reay, they both being in the country for the vacation. But I have written to Lord George to give me a few minutes' interview should he come down for a Cabinet meeting, or let me go and see him at his place, before I leave for America on the 24th. I must try to do this, as on my return from America I may not have more than three or four days to spare here.'

Fortunately Mr Tata was eventually able to see Lord George Hamilton before he crossed the Atlantic, and among other things the iron and steel scheme was once more discussed.

Mr Tata sailed for the U.S.A. on 24 September, and stayed in America for some weeks. He quickly attracted the insatiable curiosity of the American newspaper reporters, and many cuttings are preserved of the amusing and not always very veracious articles which were published about him during his visit. When possible, he evaded the interviewers, or managed to pass them on to his New York Agent, Mr A. P. Cochrane, who accompanied him to various cities. At times, however, he was cornered, and then he submitted to the ordeal good-humouredly enough, and talked freely about his projects. Afterwards he was annoyed to find that one of the leading Anglo-Indian newspapers had reprinted extracts from the most fulsome of the American articles, with some rather wounding comments. He was by no means insensitive to ridicule, and in the following year he complained that he had been unfairly blamed for the reckless statements of American journalists.

That they drew extensively upon their exuberant imaginations is clear from the records which remain. One Cleveland writer, after describing him as ' a jolly good fellow ', declared that he was ' the J. P. Morgan of the East Indies ', and that his partner was ' the Nizam of Hyderabad '. When he went to Grand Rapids, a local newspaper announced that he was ' the richest man in all India and one of the wealthiest men in the entire world '. It went on to say that he was ' so rich that he has little idea of his own wealth, his possessions even exceeding those of the late Li Hung Chang, who was reckoned the richest man in the world '. It mildly complained, however, that ' he was not inclined to be communicative '. The *Birmingham Ledger* said that ' he enjoys the distinction of having refused to be knighted by Queen Victoria at the sacrifice of his religion ', and asserted that he ' wore a large diamond in his shirt '. The *Birmingham News* was much more sedate, and on the whole extremely accurate, but insisted on christening him ' John N. Tata '. It would be unfair to suggest that all the articles and interviews were wildly written.

Some were admirably done, and one of the Cleveland journals printed a very long and careful account of Mr Tata and his schemes.

Mr Tata seems to have stayed some days in New York, and then went to Washington, where he was entertained by ex-Secretary of State John W. Foster, with whom he had some previous acquaintance. The news of his scheme for working the iron deposits of the Central Provinces had already been published in the New York papers. The *Washington Post* wrote of him that he was 'merchant prince, manufacturer, and importer, and likewise philanthropist, scholar, and philosopher'. From Washington he went to Pelzer, in South Carolina, where he inspected a large cotton factory. He never lost any opportunity of enlarging his knowledge of the industry which had laid the foundation of his fortunes. Thence he proceeded to Atlanta, the capital of Georgia, and examined more cotton mills. On 20 October he reached Birmingham, in Alabama. Birmingham stands in the midst of 'an immensely rich iron, coal and limestone region', and is 'the most important centre for the production of iron and steel in the southern states'. The city also does a large trade in cotton. At Birmingham he saw Mr Erskine Ramsey and other prominent manufacturers of iron and steel, and made special inquiries into the various coking processes used in the district. The difficulties likely to be experienced with Indian coal were ever present in his mind. He told one interviewer at Birmingham about the primitive and wasteful methods of Indian smelters in the Chanda district, and said they required eight tons of ore and fourteen tons of charcoal to produce one ton of wrought iron. To another interviewer he mentioned the possibility of smelting by electricity. There was, he said, abundant water-power ready to hand; but he added that he regarded the making of coke as the key to the problem, and 'did not despair of ultimate success'. While at Birmingham, he also studied with characteristic zeal the gins and other devices for handling cotton

made by the Continental Company. Birmingham happens to manufacture large quantities of cotton-seed oil, and he was eagerly questioned about the possibility of Indian competition in this product. He replied that India had only made cotton-seed oil 'in an experimental way', and he pointed out that cotton-seed was an important food-stuff for Indian cattle. To deprive them of it, even for the manufacture of oil, would be in his opinion 'a very serious thing'.[1] His statement still holds good, though developments were even then taking place which he evidently did not foresee, as after his death his own firm carried out an experiment in pressing cotton-seed oil, which was not successful. In the first years of the new century India began to export cotton-seed in large quantities. More recently there has been some decline, and the bulk of the seed is still reserved for home consumption. In 1912-13 India exported 130,564 tons of cotton-seed, out of a total available supply of 1,306,000 tons. The exports represented a decline of 35 per cent, due chiefly to a temporary shortage of supply.

From Birmingham Mr Tata went to Chattanooga, in Tennessee, where he was again in the centre of an important iron district. Into the next twenty days he crowded a great deal of rapid travelling, for by 19 November he was back again at the Holland House in New York. On 26 October he wrote from the Auditorium Annexe, Chicago, to his son Dorabji, who was then in charge of the prospecting and other preliminary work in connexion with the investigation of the scheme:

'I am glad to see that the Chief Commissioner has been good enough to sanction the further extension of two years to our prospecting licence for iron in both the Lohara and the Peepulgaon blocks. Also that in addition to iron we are to be allowed to prospect for copper, coal, and manganese, and that we are also to be allowed a licence for the additional area for which you have applied, as it was near to Peepulgaon and was

[1] See p. 244.

reported to contain a coal bed at a place called Bandur, and limestone at Minjaree. . . .

'I am glad that our Nagpur people are busy exploring things there, and have got to discover two old borings made by Government some years ago. I am sorry you have not heard anything yet about the concession for Bellarpur coal. I hope the surveys of the P. W. Department have been completed. They may enable the Chief Commissioner to define the boundaries of his grant. . . .

'I am glad that the matter of the Pisgaon coal bed is also cleared up. I do not think we shall have much difficulty in obtaining the concession to work this in native territory on the other side of the river. . . .

'It is quite necessary for all experiments as regards the coking of our coal, that some of the Bellarpur coal should arrive here in time, as we are not quite sure about the coking of the Warora coal which we have had. Even if that should coke, and though the Bellarpur coal be richer in carbon by nearly 50 per cent, still it does not always happen that a richer carbonaceous coal is more cokeable than a poor one. So it is necessary that we have about five or ten tons of this Bellarpur coal to carry on our trials. Even if this should fail, of course we have the other coal at Umaria, which has been proved to be of a coking quality, and though nearly 250 miles from our ore, yet can still be made available for working it. . . .

'As regards the rich iron-ore field in the Indore Territory, about which the Resident spoke to you, it is a place I know. The Government of Indore spent many lakhs of rupees on it, and about three years ago advertised for sale the mines at Burwai. Nobody replied, and I believe they are still in possession of that Government and unworked; but our hands being already full in the Chanda District, I do not think that we should at all try to get these mines at Burwai, as I do not think they will be taken up by anybody within any reasonable time.'

The Resident referred to above was Sir David Barr at Hyderabad, whom Mr Dorabji saw in connexion with concessions in Berar, then under his jurisdiction.

From Chicago, which he knew quite well owing to his visit to the World's Fair in 1893, Mr Tata went to Grand Rapids, in Michigan, a city which is said to have 'a world-wide reputation as a furniture centre'. The local papers remarked that he 'attracted much attention about the streets and in the Pantlind Hotel', and were ingenuously surprised at his fair complexion. He inspected several of the large furniture factories, and made extensive purchases. All his life he was an ardent shopper, and a joy to zealous salesmen. Some of his friends were wont to say that he bought recklessly and without discretion; but it was noticeable that he always bought with a purpose. His habit of shopping largely wherever he went was really due to the promptings of his curious and inquiring mind. He wanted to test new things, and to try the products of other countries. At Grand Rapids, for instance, it is recorded that he flatly refused to look at articles made of mahogany, with which he was familiar, and only bought goods made of bird's-eye maple and other typical American woods. Even in the midst of his absorption in his great schemes, he also found time at Grand Rapids to drive out and inspect the black bass hatchery at Mill Creek.

His next important stop was at Cleveland, in Ohio, on the shores of Lake Erie, where he was at last approaching the ultimate object of his journey to America. Cleveland is 'the largest ore market in the world', and manufactures enormous quantities of iron and steel products. Mr Tata was welcomed to the city by Senator Mark Hanna, famous as the campaign manager of the Republican Party, the apostle of the 'full dinner pail', and the devoted ally of President McKinley. Senator Hanna summoned to his office more than a score of local authorities on iron and steel, including some of the officials of the American Steel and Wire Company. The conference about the Indian project lasted several

hours, and the papers afterwards noted that those who talked with Mr Tata said that he was 'remarkably quick in grasping things, and that he gained considerable valuable information'. Senator Hanna also entertained Mr Tata at a dinner party, whereupon the newspapers flared forth with the headlines: 'Hash for Tata. Hanna Invites the Indian Merchant Prince to Dinner.' Another of his hosts at Cleveland was Colonel Myron T. Herrick, the President of the American Bankers' Association. While in Cleveland, too, he saw a good deal of Mr A. E. Brown, the head of the Brown Hoisting Machinery Company, and examined the Company's mechanism at work in the Cleveland Docks. He said afterwards:

'We need just such an improvement as that in Bombay. There are usually at least thirty big vessels there receiving or discharging cargo, and the methods used are slow and unsatisfactory. Till I saw the Brown mechanism working I had supposed that the best and quickest work of loading vessels was accomplished at Nagasaki, where I have seen the natives load 2,000 tons in ten hours.'

It should be added that the Bombay Docks, which have since been much enlarged, are now amply equipped with hydraulic cranes and other contrivances of the most modern type.

Commissioner Booth Tucker, of the Salvation Army, writes respecting Mr Tata's visit to Cleveland:

'One of the most pleasant associations I had with Mr Tata was during the time when I was in charge of the work of the Salvation Army in America. He had written to tell me of the many difficulties he had encountered in launching his great steel enterprise. I suggested that he should come over and visit the principal steel centres in America, and get in touch with the leading magnates connected with the Steel Trust and other great Corporations. Amongst these were some warm friends and admirers of the Salvation Army, and these would, we felt sure, give all desired information and assistance.

'In this we were not disappointed. America is keenly interested in India, and there was a touch of romance which appealed strongly to the American mind in the landing of the great magnate and philanthropist.

'Judge Cory, the President of the Steel Trust, invited us to luncheon to discuss matters, and the door was thrown wide open to their Indian guest to visit the very arcana of the Steel World, and to help himself to all the information and advice that the greatest steel leaders of the world could supply. A banquet was arranged at Cleveland by Senator Hanna and Colonel Herrick, and nothing could have exceeded the cordiality of Mr Tata's reception.

'It was interesting to see Mr Tata in close touch with such geniuses as Senator Hanna, who was then in the zenith of his power, and who, as Chairman of the Republican Party, might well have been termed the uncrowned king of the United States. I was proud of our Indian representative. Amidst such a constellation of suns and moons, stars of even exceptional brilliance would have disappeared from view, or at least been dimmed. But our Indian luminary lost nothing of its brilliance in this company. It was a great gratification to me to learn afterwards from these leaders that a profound impression had been made upon them by their guest, and that it had given them a new idea of Indian possibilities.'

It was at Pittsburg in Pennsylvania, however, that Mr Tata at last attained his purpose, and found precisely the advice and help he sought. Pittsburg ranks first among the cities of the U.S.A. in the manufacture of iron and steel products, of which it sends forth more than 50 per cent of the output of the whole country. It stands in the midst of productive coal-fields, and absorbs a large proportion of the iron-ore produced in the Lake Superior region. Its neighbourhood contains the chief plants of the immense United States Steel Corporation. It is the home of the Westinghouse Company, the famous organization which manufactures electrical apparatus,

air brakes, and railway signals and other devices. Mr Tata appears to have seen Mr George Westinghouse, the inventor of the air brake, almost as soon as he reached Pittsburg. Despite his preoccupation with the iron scheme, he was thinking constantly of the proposal for creating and harnessing water-power in the Western Ghats. Mr Westinghouse had played a large part in the utilization of the Niagara Falls, and it was under his guidance that Mr Tata, while at Pittsburg, made a special journey to Niagara to inspect the machinery used there. He was also entertained at Solitude, the residence of Mr Westinghouse at Homewood. Iron soon reclaimed him, however. He went over the Homestead and Duquesne mills of the Carnegie Steel Company, and met many leaders of the industry; but the great result of his Pittsburg visit was that he encountered at last the man for whom he had been searching.

This was Mr Julian Kennedy, the head of the firm of Julian Kennedy, Sahlin and Co. Ltd, Engineers, whose headquarters are at Pittsburg, with a branch at Brussels. Mr Kennedy is one of the foremost metallurgical engineers in the world, and has a reputation which may well be described as international. His partner, Mr Axel Sahlin, who in normal times is stationed in Brussels, is an equally remarkable man, of varied knowledge and wide experience. Mr Tata unfolded his scheme to Mr Kennedy and received the practical counsel he required. Mr Kennedy's acquaintance with the iron and steel business is encyclopædic, but his firm now specializes in the designing of metallurgical plants. He told Mr Tata that he must first institute a far more thorough and scientific investigation of the local conditions, the raw materials, and the markets of India, than he had hitherto done. He also warned him that the preliminary inquiries would probably cost large sums of money; but he pointed out that it would be unwise to embark upon an enterprise which in the end would cost millions, without first conducting an exhaustive examination of the possibilities. If, he said, Mr Tata

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was prepared to face the cost, then he knew no one better qualified to undertake the geological work, which must be the initial step, than Mr Charles Page Perin, an eminent consulting engineer of New York.

Mr Tata was not dismayed. He believed in his scheme, and was determined to go through with it. His search was over, for he resolved to follow Mr Kennedy's advice implicitly, and did so to the end. He returned at once to New York and saw Mr Perin, whose services he engaged. Mr Perin could not go to India at that time, and advised Mr Tata to employ his associate, Mr C. M. Weld, another man of remarkable energy and capacity. Mr Weld agreed to begin the work, and started for Bombay almost immediately. Mr Tata stayed in New York a few days longer, and reached London on 25 November. He was only four days in England, after which he hurried to Germany and settled the contract for the electric lighting plant for the Taj Mahal Hotel. He sailed from Trieste for Bombay in an Austrian Lloyd Steamer at the beginning of December, being accompanied by his relative and partner, Mr R. D. Tata, and Mrs Tata. Mr R. D. Tata had gone with him to the U.S.A., but did not accompany him on his journey to the south and to the iron districts. He says it was remarkable to notice how closely Mr Tata concentrated upon his schemes during the American visit. He declined to go anywhere sight-seeing, except to mills and other enterprises in which he was specially interested. The story of his diamond studs was constantly printed, although as a matter of fact his sleeve-links and studs were of the plainest silver. No man was less ostentatious in his apparel. In New York an interviewer one day followed him into a shop while he was buying some boots. Mr Tata declined to be interviewed, but next day a New York newspaper gravely announced that 'the Pierpont Morgan of the East' was trying to acquire a monopoly of the American boot trade.

Two days after he reached Bombay, he went to Delhi,

to attend the Imperial Coronation Durbar held by Lord Curzon to mark the accession of King Edward VII. Mr Lovat Fraser says, 'I remember meeting him in the arena of the amphitheatre before the Durbar on New Year's morning. He was clad in the simple white dress of his race, which he usually wore when in India. Mr Tata attended the Durbar as a private visitor, and his name does not even appear in the official Directory of the Assemblage. There was something lacking in a method of selection which omitted one of India's most prominent men from the list of official guests.'

As soon as he saw his son Dorabji, on his return to India, Mr Tata urged him to concentrate upon the iron scheme. Mr Dorabji agreed to do so, and from that time onward the enterprise was largely in his charge. Mr Tata, whose health was already beginning to fail, did little more active work upon it. During the remainder of his life he kept in close touch with the undertaking, gave constant advice, and saw the various persons employed upon it when they passed through Bombay; but henceforward the story deals with the labours of others. Mr Tata conceived the broad idea; he got the scheme moving; he found the large sums required to keep it going; but he was no longer able to face physical strain as he was when he personally superintended the building of the Empress Mills in the seventies. His mind moved as vigorously and spaciously as ever. There were moments in the last two years when to those around him his schemes and dreams seemed more illimitable than they had ever been before. Had he had another twenty years of robust health he might have done wonderful things; but in the twilight of his career he had to stand aside, and he did so with calmness and without vain regret. No one ever heard him complain of his diminishing energies. It was, indeed, difficult even for his own family to realize that his strength was slowly ebbing. His interest in affairs remained fresh and keen almost to the end; but he could not undergo the intense and laborious toil which the iron scheme was now to involve.

The prospecting work in the Chanda District was at that time being conducted under the supervision of Mr Shapurji Saklatvala, a nephew of Mr Tata. Mr Saklatvala was not an expert, and it was through no fault of his that the enterprise had languished. He had established camps in various places in the blocks for which Mr Tata held prospecting licences. He was also boring for coal in a new coal-field beyond Bellarpur, a place 38 miles south-east of Warora. The Bellarpur coal measures are mentioned in Mr Tata's letter from Chicago. A concession had been sought for the Bellarpur coal. The Government refused to grant it, because it had decided to open up the Bellarpur field itself. Permission was given to try farther on, but it was feared that at the allotted point the seam dipped.

In April 1903, Mr Weld and Mr Dorabji Tata joined Mr Saklatvala, and entered upon a period of adventurous wanderings which was often marked by much privation. The heat in the Central Provinces in April, May, and June is intense. The prospectors were generally moving far from the railway, and sometimes had difficulty in obtaining food. Water was frequently scarce and bad, and they were often compelled to make their tea with the soda-water they carried on their carts. There were times when they could make hardly any progress at all. The district includes large forest areas, which are the joy of the hunter because tigers are numerous; but prospectors for iron and coal regard a multiplicity of tigers with more apprehension than delight. Roads were few and indifferent. Sometimes the party found shelter in a village house, but there were many nights when they had to sleep in their carts. At first they lived very roughly indeed. At a later date, when the magnitude of their task dawned upon them, they procured tents and pitched camp in orthodox fashion. Wherever they went, Mr Weld made a careful geological examination of the locality, conducting his researches with much minuteness and patience. He had many curious experiences during the four years he spent in India at the instance of the Tatas;

and should he ever commit them to paper, they will form a prose epic of prospecting.

There were simultaneous difficulties of another kind. Lord Curzon, who was eager to see iron and steel works established in India, grew impatient at the delay. He wanted to know what Mr Tata was doing with his prospecting licences, expected to see tangible results, and had small sympathy with the slow and cautious methods adopted on the advice of Mr Kennedy and Mr Perin. Sir Thomas Holland, the Director-General of the Geological Survey, was more appreciative, but at that early stage could give little help. He too had to await results. Then rival prospectors appeared in the Central Provinces. Sir Ernest Cassel, the great capitalist, who has done so much for the development of Egypt, had visited India during the cold season of 1902-3, and the Viceroy had aroused his interest in the iron question. He was advised to investigate iron deposits which were reported to exist in the neighbourhood of Jubbulpore, in the most northerly portion of the Central Provinces. He sent out two experts, Mr E. P. Martin and Professor Henry Louis, who examined the Jubbulpore District with considerable care. Mr Tata regarded their advent with calmness. He had made private inquiries, and was advised that he had nothing to fear from Jubbulpore. The advice he received was accurate. Messrs Martin and Louis have recorded their researches in the *Agricultural Ledger*, in a report upon ' Native Methods of Smelting and Manufacturing Iron in Jabalpur '. The conclusion they came to was that ' the entire district undoubtedly contains considerable quantities of ferruginous material, but the latter is nowhere concentrated into what may be called a workable ore deposit showing the essential characters of steadiness and persistence which are indispensable in a deposit that is to form the basis of an important industry '. There was no prospect of a successful iron and steel works in the Jubbulpore area. Messrs Martin and Louis further stated that most of the Jubbulpore ore, being in the form of soft micaceous

hematite, was physically unfit in its natural condition for use in a blast furnace. Moreover, the ore contained a proportion of phosphorus too high for acid Bessemer steel.

That was the end of Sir Ernest Cassel's endeavours, but other competitors were less seemly. For some time Mr Weld and Mr Dorabji were shadowed wherever they went. Prospecting licences were granted to people who worked in close proximity to themselves, occasionally almost within sight of them. They were taken up by people who hoped to dispose of them at a profit later on to the Steel Company when formed. These annoyances ceased in the end so far as the Chanda District was concerned, for the speculators whose imagination had been fired by a perusal of General Mahon's Report did not possess the requisite patience and persistence; but the day came at length when even Mr Tata and his agents began to despair of attaining success. Mr Weld had quartered the whole area covered by the prospecting licences, and had travelled far and wide in search of suitable coal and a water-supply. Iron he had found in Chanda in considerable quantities. Limestone was there in abundance, but with the Bellarpur seam barred, the coal difficulty seemed insuperable. The Warora coal mine, on which Mr Tata had originally built such strong hopes, was getting worked out, and the Government was already preparing to shift its local operations from Warora to Bellarpur. In the matter of water and freight facilities the outlook was more promising. A large reservoir was projected in the district, and the authorities were willing to furnish water therefrom. Sir Reginald Craddock, then Commissioner of the Nagpur District, who later became Chief Commissioner of the Central Provinces, was pressing forward a plan for the construction of a new railway—since built—from Chanda to Gondia, which would pass close to the iron deposits at Lohara. He expressed himself ready to advocate the addition of such branch lines to the ore-fields as were necessary. By this time, the Central Provinces Administration

had become so thoroughly convinced indeed that Mr Tata and his representatives were in earnest, that they gave them the warmest help and encouragement. But coal was the obstacle, and through lack of it the whole scheme was imperilled.

At this critical stage it happened that Mr Martin and Professor Louis passed through Bombay on their way home after their investigations in the Jubbulpore district. They saw Mr Tata and inquired about the progress of his prospecting work in Chanda, probably with some idea of an amalgamation with Sir E. Cassel. At their instance Mr Tata sent a telegram to Mr Dorabji, who was then in Chanda with Mr Weld, to ascertain how much ore was in sight there, as they advised him that unless there was enough for at least fifteen years' working it was not worth anyone's while to go further with the scheme. General Mahon had suggested that Lohara hill was probably an outcrop and that the deposits in Peepulgaon and other places were part and parcel of the same ore-field. Mr Weld had some trenching work carried out all round the hill to find out if the ore extended any distance beyond the hill. The result of the inquiry proved that the various deposits situated at some distance from each other were not continuous but mere 'pockets', and that there was not enough ore in Lohara hill to justify starting iron works. So reluctantly they had to come to the conclusion that the Chanda project must be given up, and they asked Mr Tata to inform Government that it was not possible to start an iron and steel industry in India. Mr Weld then went alone on a final tour, inspecting various new coal-fields which had been found, and examining all the rivers in the Central Provinces in the hope of finding a place where, by damming, a cheap water-supply could be provided. He came back unsuccessful, and in the ensuing despondency all the prospecting licences held by Mr Tata were subsequently surrendered, except the one relating to Lohara.

CHAPTER IX

THE FINDING OF SAKCHI[1]

1903

At this stage one of those chance incidents which make or mar all great enterprises stirred their energies afresh. Mr Dorabji Tata went to Nagpur to see Sir Benjamin Robertson, then the Chief Secretary of the Central Provinces Administration, to inform him about the conclusion they had arrived at. The Chief Secretary happened to be out, so he drifted rather aimlessly into the museum opposite the Secretariat to await his return. There he came across a geological map of the Central Provinces, printed in colours. He noticed that the Drug District, near Raipur, about 140 miles from the Chanda area, was coloured very darkly, in a hue which was meant to indicate large deposits of iron. He called Mr Weld, who had accompanied him, to look at the map. Mr Weld recollected that he had seen some mention of the district in the reports of the Geological Survey. In a case in the museum they found a specimen of very good iron ore from the Drug area. Let no one say after this that museums in India serve no useful purpose.

When Sir Benjamin Robertson reached his office, Mr Dorabji reluctantly told him that it would be impossible to work the Chanda ore unless cokeable coal could be obtained near at hand. He went on to ask about Drug, and told him what he had seen in the museum. Sir Benjamin produced the records of the Geological Survey, and it was found that fifteen years earlier Mr P. N. Bose, a Bengali, employed as a survey officer, had gone through the district looking for iron. In a report of 1887 he had mentioned that the neighbourhood was rich in iron-ore, but his investigations

[1] By Mr Lovat Fraser.

seemed to have been cursory, and his report had long been forgotten. Had Mr P. N. Bose pushed his inquiries a little farther, he would have stumbled upon one of the richest deposits of iron-ore in the world. One wonders, after the revelation which was about to be unfolded to the Tatas, how many other stores of minerals still lie hidden in India, awaiting chance discovery.

The prospectors lost no time. They did not know what lay before them, but they thought the Drug District was worth looking at. Mr Weld, accompanied by Mr Saklatvala, went at once to the spot indicated, and put up at a dak bungalow at another Lohara, called Dondi-Lohara. Again they found themselves shadowed by other prospectors whose agents were there on behalf of mining syndicates, searching for more manganese mines. That was the period when manganese production in India underwent enormous expansion, and when relatively impecunious people in Bombay and elsewhere rapidly grew rich beyond their wildest dreams. The country was pervaded by agents looking for fresh manganese ' propositions ', and it was remarkable how many of them prospered. The manganese industry in India is now firmly established, and the latest returns show that it continues to expand. Mr Dorabji Tata has since stated that he could have obtained several promising manganese concessions during his journeys through the Central Provinces; but he was looking for iron, and would touch nothing but iron, even if it meant money.

The occupants of the bungalow were not the only other prospectors in the neighbourhood. It was hard, indeed, to go anywhere in the metalliferous regions of India at that juncture without striking the trail of a prospector; but though most of them were trying to find more manganese with as much ardour as the knights of old displayed in hunting for the Holy Grail, Mr Weld and his associates soon realized that they included pertinacious folk who did not disdain common iron ore. Finding Mr Weld at work with a hammer on the outcrop there, they concluded that he was after that body

of ore, and wired to their principals, who put in an application for a prospecting licence before Mr Weld had quite realized what had happened. But this was of no consequence, as he had come to the conclusion that the Dondi-Lohara ore was only a 'pocket', and he had no intention of applying for it, as he had come to inspect the Dhalli and Rajhara hills a few miles farther on. The whole district seemed full of promising indications, and he felt convinced that he had only to proceed farther in order to succeed. So he started early one morning in a country cart, and by a lucky chance took his gun with him in the hope of picking up some game for the cooking pot. Those who were shadowing him, not having heard of any other deposits in those parts, believing that he was going out on a shooting expedition only, did not think of following him, and were thus thrown off the scent. He reached the village he was looking for, and found some iron smelters who worked with primitive furnaces. He asked them where they got their ore, and they took him to a hill about 300 feet high. 'We get it from this hill,' they said. Mr Weld climbed the height, and was astonished to find that his footsteps rang beneath his feet as though he was walking upon metal. That was precisely what he was doing. He had found a veritable hill of almost solid iron! No more striking and remarkable discovery has ever been made in the whole history of the iron industry; and there was another hill not far away which was chiefly composed of iron also.

Hurrying back to Nagpur at once, he applied for a prospecting licence for the Dhalli and Rajhara hills; the licence was granted, in due course, after some official delay.

The next step after obtaining the licence was to make borings in the hills with diamond drills, and this was done on an extensive scale in the Rajhara hill under Mr Weld's supervision. The cores of the borings were analysed, as were also average samples picked up at random. The result of the first rough analyses showed

that the ore carried about 65·5 per cent of iron; and more careful tests afterwards proved it to be even richer. It may be mentioned that the record maximum yield of iron ore on being smelted is 70 per cent. Specimens were forwarded to the Geological Survey, and Mr Dorabji Tata took the earliest opportunity of seeing Sir Thomas Holland. The Director-General was frankly incredulous, and could not believe that ore had been found in India which yielded 65·5 per cent of pure iron. He said that iron was not found in such solid masses, to his own knowledge; that the deposits usually lay in streaks like streaky bacon; and that he felt the stories told him must be exaggerated. Mr Dorabji invited him to come and see for himself.

He did so. On his next tour in the Central Provinces, Sir Thomas made a special journey to Dhalli and Rajhara. He had to do the journey on an elephant for 45 miles to the Tata camp at the foot of the Rajhara hill, and he arrived there one very hot morning shortly before noon. He refused a tub and breakfast, and said he would like to make his inspection at once. He went up the hill with Mr Weld, Mr Dorabji Tata remaining at the camp. His footsteps rang as they climbed the slope together. Even an inexperienced man would have soon perceived the nature of the substance on which they were walking. To the expert it was quickly obvious. Half-way up the hill Sir Thomas stopped and said: 'I need go no farther. I have seen enough. I only wanted to satisfy myself that, at the rate you propose to work, you have enough ore to last you for fifteen years, with an output of 250 tons a day. I am satisfied that you have. All I wish to test now is your analysis. I will pick my own specimens.' He returned to the camp, and the samples of ore he had gathered were afterwards proved on analysis to contain 67·5 per cent of iron. Thenceforward Sir Thomas Holland was a most cordial ally and helper of the Tata enterprise, and gave it all the encouragement he could.

In the *Quinquennial Review of the Mineral Production of*

India during the years 1904 to 1908, by Sir Thomas Holland and Dr L. Leigh Fermor, the iron-ores in the Dondi-Lohara district covered by the Tata licence are thus described:

'The iron-ores, on account of their resistance to weathering agents, stand up as conspicuous hillocks in the general peneplain. The most striking of these is the ridge which includes the Dhullee (Dhalli) and Rajhara hills, extending for some 20 miles in a zigzag, almost continuous line, and rising to heights of sometimes 400 feet above the general level of the flat country around. The iron-ores are associated with phyllites and are often of the usual type of banded quartz-iron-ore schists characteristic of the Dharwar system. But in places thick masses, apparently lenticular in shape, are formed of comparatively pure hematite, and one of these in the Rajhara hills has been subjected to very careful examination by diamond drilling. The Rajhara mass was carefully sampled across the surface at each point selected for a drill hole, and the cores obtained were also analysed in lengths representing successive depths of 10 feet each from the surface, giving altogether sixty-four samples which were assayed for iron, phosphorus, sulphur, silica, and manganese. The average results obtained for the surface samples were as follows: Fe, 66·35; P, 0·058; S, 0·108; SiO_2, 1·44; Mn, 0·151 per cent; while for the cores the averages were: Fe, 68·56; P, 0·064; S, 0·071; SiO_2, 0·71; Mn, 0·175 per cent.

'In this mass the prospecting operations thus proved the existence of two and a half million tons of ore carrying about 67·5 per cent of iron and phosphorous content only slightly below the Bessemer limit. The quantity estimated is that which may be regarded as ore in sight, while almost certainly much larger quantities may be obtained by continuation of the ore-bodies beyond their proved depth. There are other large bodies of ore in this area which have not been examined in the same detail. These masses of hematite include small quantities of magnetite, but separate determinations of the iron in the ferric state have not been made in order

to determine the relative proportions of the two minerals.'

Here, then, was iron in extraordinary abundance at last, and of the highest quality. Mr C. P. Perin, when he afterwards visited Dhalli and Rajhara, declared that they were one of the mineral wonders of the world.[1] But the coal difficulty was as insistent as ever, and Mr Weld carried out a long and careful survey of the Jherria and Ranygunj coal-fields, and on Mr Perin's advice eventually came to the conclusion, as General Mahon had tentatively done at an earlier period, that the only suitable coal in India for coking could be obtained from the Jherria coal-field in Bengal. About 8 or 10 tons of Jherria coal were therefore sent to Germany and America, together with a quantity of Dhalli and Rajhara ore. The coal was tested, and its cokeable quality ascertained; and the ore was smelted with the coke thus produced. The reports were highly satisfactory.

The water question next received further attention. A large and constant supply of water was required to cool the great furnaces which were to be built. It was essential to find a river which was not materially affected during the dry season. Once more the rivers of the Central Provinces were surveyed during the period of drought, as well as in the rains. Mr Weld considered in the end that the works must be established outside the Central Provinces altogether. He selected the River Mahanadi, which enters the Bay of Bengal below Cuttack; and he chose a suitable site near Sambalpur, at Padampur, in the district of that name, which then formed part of the old province of Bengal. Apart from the water-supply, the great advantage of Sambalpur was that it lay almost midway between the Dhalli and Rajhara deposits and the Jherria coal-field. The haulage necessitated would be considerable, but by no means in excess of the conditions sometimes found in other iron-producing countries. Both Sambalpur and Jherria, it may be noted, are now included in the

[1] Sir Dorabji Tata states that the ore-fields since discovered in Orissa are equally rich and far more extensive. F. R. H.

new province of Bihar; but Eastern India has been so much chopped about in recent years that it is often difficult to remember the provincial differences. All the modern atlases of India are now rendered obsolete.

To Padampur, therefore, the Tata camp was moved, and the tents were pitched on the banks of the River Mahanadi. The great stream was studied in order to find a point at which it could be effectually dammed. Mr Perin arrived from America to test the investigations already made, and to give his advice in the final shaping of the scheme. The time had arrived to submit more definite plans to the Government of India, and to apply for a formal concession. By the time the camp was shifted to Padampur, the sum spent upon preliminary work considerably exceeded £30,000. Mr Tata had breathed his last at Nauheim, but his successors were steadfastly determined to carry his great idea to fulfilment. Although he had done little for the scheme in the closing months of his life, his Bombay offices had kept closely in touch with it. His chosen lieutenant, Mr B. J. Padshah, sat untiringly in Bombay, watching and checking all the reports with the utmost vigilance. He conducted most of the voluminous correspondence, supervised the accounts, framed innumerable and intricate bodies of statistics and estimates, and, in conjunction with Mr Dorabji Tata, exercised a general control over the whole investigation. But it was by his enthusiasm, still more than by his actual labours, that Mr Padshah rendered inestimable service to the undertaking during these years of patient research. His faith never flagged, and he infused his own confidence into his colleagues.

But the Padampur project was never destined to be begun in real earnest. Although no one realized it, in crossing the boundary into Bengal the Tatas had at last drawn near to the final goal of their endeavours.

One morning the Tata firm received a letter from Mr P. N. Bose, whose name was already familiar to them by reason of his report upon the iron deposits in the Drug District. Mr Bose explained that he had

retired from his post in the Geological Survey, and was now in the employment of the Maharajah of Mourbhanj. The state of Mourbhanj is one of the tributary states of Orissa, and was then included in the province of Bengal, but is now under the control of Bihar. The Maharajah is subject to British suzerainty, but exercises larger independent powers than any of the other independent chiefs in Orissa. He wanted to develop his territories, and had engaged Mr Bose to report upon the mineral resources they contained. Mr Bose, with the concurrence of the Maharajah, informed Messrs Tata Sons and Co., that he had found very rich deposits of iron, and invited them to send representatives to inspect the ore-fields. His statements were on the whole below the mark. In the story of the industrial development of India Mr Bose is assured of permanent mention. His inquiries were the prelude to the discoveries of Mr Weld in the Drug area, and he now pointed the way to still more promising results. His work is one more refutation of the current criticism of Bengalis on the supposed ground that they are not practical men.

The Tata partners were perplexed by the letter of Mr Bose. They thought no deposits of iron in India could equal those they had discovered at Dhalli and Rajhara. At the same time, the statements of Mr Bose were disturbing. It was clear that he had found important ore-fields. They were also well aware that more iron was being traced in the adjacent British districts of Manbhum, Singbhum, and Dhalbhum. All these districts were far closer to the Bengal coal-fields than Sambalpur, and even the state of Mourbhanj was not more than 150 miles eastward of their projected works. Supposing some rival firm stepped in and reaped all the advantage of the shorter railway haulage? The Tatas hoped eventually to make pig-iron for export far more cheaply than anyone had ever yet done in India, but where would they be if others were able to make it cheaper still? The success of their scheme depended on the cost of transport of their products

to the coast, and still more upon the cost of assemblage of iron-ore, coal, and limestone at their works. After some hasty statistical investigations regarding the relative cost of production, they realized that they must look at Mourbhanj without delay. In their wanderings they continually drifted farther east.

The state of Mourbhanj was at that time controlled by an unusually enlightened ruler, who died in 1912. It remains today an exceedingly picturesque territory, one of many such areas which the transient visitor to India never sees, and of whose character he has little conception. Mourbhanj is over 4,200 square miles in extent, and in its centre lies a tract of richly wooded hills covering 1,000 square miles. The hills are almost uninhabited, and though this hilly region is within 150 miles of Calcutta, the greater part of it has never been explored. Those who have looked across the plain at the hills of Mourbhanj are astonished at their wildness. One peak in the south reaches a height of nearly 4000 feet. Herds of elephants wander amid the Mourbhanj jungles, and other big game abounds. The ruling family is said to be of Rajput origin, and has held the principality for 1,300 years; but like all the Orissa chieftains, the Maharajahs paid tribute to the Mahrattas until the British broke the power of that race of conquerors. Most of the people are of aboriginal descent, and they include nearly 200,000 Santals. Mourbhanj is one of those Indian backwaters which the successive tides of conquest touched but lightly. Even British influence has not penetrated very deeply, and such advancement as has been accomplished is mainly due to the efforts of the later chiefs themselves. Agriculture is the principal industry, and in the plains there is ample room for its expansion. But Mourbhanj is not rich in fertile lands alone. It has magnificent mineral deposits, the true extent of which was only understood when the experts employed by the Tata firm responded to the Maharajah's invitation.

More than one appeal was received from the Maharajah

before the first actual visit; but at last Mr Dorabji Tata, Mr Perin, Mr Weld, and Mr Saklatvala went to the Mourbhanj territory. They had to journey to Midnapur and thence down the East Coast to Rupsa Junction, whence a little narrow-gauge line took them to Baripada, the capital of the state, 32 miles away. Baripada is a quiet place with 6,000 inhabitants, and the usual high school, courts, public offices, and dispensary invariably found nowadays in the chief town of a well-conducted protected state. The party was met by Mr Bose, and afterwards received by the Maharajah, who welcomed them very cordially. Mr Bose expounded the promising results of his survey of the state's resources, and Mr Weld began afresh his interminable inquiries.

After the preliminary discussions with the Maharajah, Mr Dorabji Tata left for Calcutta. Mr Perin and Mr Weld, accompanied by Mr Bose, plunged into the trackless hills in the direction of the ore-fields, which are situated in the north-west districts of the state. They were carried in *dholies*, and had numerous exciting and uncomfortable experiences. At length, in the Bamanghati sub-division, their frequent meetings with native iron-smelters working with crude apparatus showed them that they were reaching the end of their long quest. In the lofty Gurumaishini Hill, which rises to a height of 3,000 feet, they found enormous deposits of iron-ore, quite as extensive as those at Dhalli and Rajhara, not so compact and not quite so rich, but more favourably situated. They further found hundreds of acres of rich 'ore-float'—ore lying loose on the surface, which required no mining, and simply had to be picked up by unskilled labour. The explorers were in the presence of a treasure-house far more potentially valuable than most gold mines. The merest superficial examination indicated that the supply of ore was very extensive. Mr William Selkirk, mining engineer, of London, reported at a later date that when 15 million tons of ore had been won, the property would still be far from exhausted. For many years the 'float'

SHAPURJI SAKLATVALA

BURJORJI PADSHAH

SIR BEZONJI DADABHAI MEHTA

C. P. PERIN

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ore alone would be sufficient to supply the furnaces. Mr A. Sahlin afterwards said that the ore-beds consist of 'intensely metamorphosed ancient surface flows. The ore, here as in Brazil, forms a solid cap on the tops of the mountains, and covers the slopes in the form of larger and smaller stones and float. The cost of mining is therefore very low indeed.'

The party was told by the local smelters of other ranges farther away, almost equally rich in ore. They made perfunctory explorations, and saw enough to convince them that the statement was true; but the weather was exhausting, the district malarious, and they had obtained all the proof they required. Mr Weld was stricken with high fever, and marched 30 miles to a railway station while his temperature was much above normal. Mr Perin and Mr Bose found their way back, and a long and careful consideration of the new facts followed. It was clear that Mourbhanj offered advantages superior to those of Dhalli and Rajhara. It was far nearer the sea, and nearer the coal-fields. If, as the firm hoped, they would in time develop a large export trade in cheap pig iron, the shorter railway haulage was of inestimable importance. The Sambalpur scheme was therefore abandoned, and the Dhalli and Rajhara ore-beds were retained as a reserve source of supply. The firm came to terms with the Maharajah of Mourbhanj, who treated them with great consideration. He agreed to allow them to take ore for the first three or four years without any royalty, and then to charge a royalty beginning at half an anna ($\frac{1}{2}$d.) per ton, and gradually rising to 8 annas (8d.) per ton. The average royalty works out over a term of fifty years at $3\frac{1}{2}$ annas ($3\frac{1}{2}$d.) per ton. The lease which was ultimately granted by the Maharajah covers an area of 20 square miles.

Sir Thomas Holland was asked if he would like to inspect the new mine. His reply was characteristic. 'If the Tatas,' he said, 'are prepared to forsake Dhalli and Rajhara, that is all the proof I require of the value of their new discovery.' In the *Quinquennial*

Review, from which quotation has already been made, the following account of the principal Mourbhanj iron deposits, summarized from the later observations of Mr Weld, appears:

'Recent prospecting operations have determined the existence of over a dozen considerable deposits of high-grade ore in the more accessible parts of the Mourbhanj State. Of these deposits three—namely, Gurumaishini, Okampad (Sulaipat), and Badampahar—so far overshadow the others that reference will be made in detail to them alone. The chief point of interest in connexion with the smaller deposits is that in every case the nature or type of occurrence is practically identical with the great deposits, they being miniature reproductions as it were of the latter. As the main work of the prospectors has been devoted to the first necessary problem of determining the superficial disposition of the richer ore-bodies, very little has been done so far in the way of studying the geological relations and genesis of the ores.

'The ore-deposits have all been found to take the form of roughly lenticular leads or bodies of hematite, with small proportions of magnetite, in close association with granite on the one hand and granulitic rocks on the other. These latter have been noted in the field as charnockites, the term being employed, rather loosely no doubt, but probably in the main correctly, to cover types of pretty widely-varying acidity. In still more intimate association with the ores than either of the foregoing were found masses of dense quartz rocks, frequently banded, and banded quartz-iron-ore rocks. These last are of the types so commonly associated with Indian iron-ores, but are here not so prominent as is usually the case. Lastly, there exists a net-work of basic dykes certainly cutting the granite and apparently cutting the iron-ores and charnockite.

'In a very broad general way the impression so far received has been that the ore-bodies occur at or near the contacts between the granite masses and the charnockites. This impression is pregnant with suggestion, but

needs a great deal of verification. The relative age of the granite and charnockite has not as yet been determined.

'The Gurumaishini hill-mass, with its three prominent peaks, the highest rising to an elevation of 3,000 feet above the sea-level, and its numerous flanks and spurs, forms a conspicuous feature in the topography of the northern part of the State. The enormous bodies of iron-ore offered at this point and their accessible position have combined to make it the first point of attack. The ore deposits of Gurumaishini occur in three parallel and separate leads, which are 7,000, 5,500, and 3,000 feet respectively in length, and vary in width from 300 up to 700 or more feet. Further, there are three large, isolated, irregularly shaped masses, the 3,000-foot peak itself being one of these. The vertical difference in level between the lowest and highest crops of ore is practically 2,000 feet.

'The quantity of ore is certainly very great, the superficial area occupied by it amounting roughly to 10 million square feet. It is too early to put forward any formal estimate of tonnage, however, as we are able to judge of the depth of the ore only from the vertical differences in elevation of the various outcrops. In addition to this ore in places there are large blankets of rich ore "float" extending over some 750 to 800 acres.

'The quality of the ore is best indicated by quoting the following analyses of samples taken in the course of the several examinations to which the deposits have been subjected:

	Iron	*Phos-phorus*	*Sulphur*	*Silica*
	Per cent	Per cent	Per cent	Per cent
Average of eleven samples, both solid and 'float' ore	61·85	0·135	0·036	4·08
Average of twenty samples of 'float' ore	61·46	0·048	0·036	3·34
Average of ten samples of solid ore	64·33	0·075	0·021	1·64

'A number of these samples was put through a complete analysis, thereby proving the absence of titanium, chromium, zinc, nickel, and cobalt (except in one case where 0·090 per cent was found), copper, lead, and baryta; and the presence of arsenic in traces only (in one case up to 0·008 per cent).

' The Gurumaishini ore will be mined by open cuts, the breasts advancing along the ridges in terraces or benches, with gravity inclines to lower the product to the bottom of the hill, where it will meet the broad-gauge railway. A large proportion of the first few years' dispatches will be "float" ore, gathered up at a very minimum of expense. The day when ore below drainage will have to be drawn upon is very far distant.

' The Okampad ore deposit is situated just west of the Khorkai river, where the latter breaks through the Sulaipat-Badampahar range. Okampad is a conspicuous peak, only slightly lower than the Sulaipat peak (2,535 feet elevation) which lies 1 mile to the south-west of the former. Gurumaishini lies 12 miles to the north-north-east. A representative sample of the ore gave on partial analysis: Fe, 63·11; P, 0·029; S, nil; Ti, nil per cent.

'A 13- to 15-mile extension of the Gurumaishini Railway will tap the Okampad deposit when the time comes for its development.

' The ore-body occurs as a single great lens, exhibiting at one point a scarp about 300 feet high, and covering a superficial area of some 300,000 or more square feet in plan. There are, besides, two smaller outliers, and about 165 acres of "rich float" ore. The immediate associates of the ore are banded quartz-iron-ore rock and a dense blackish quartzite, the latter especially abundant; all these are completely enclosed in what has been referred to in the field notes as trap. The low-lying country to the north-west is occupied by granite.

' Four samples of Okampad ore, taken at two different

times and by two different observers, gave the following average analysis: Fe, 67·65; SiO_2, 1·58; P, 0·043; S, 0·012 per cent.

'The last of the three major deposits occupies the Badampahar peak (2,706 feet elevation), in the Sulaipat-Badampahar range, 8·5 miles south-west from Okampad. Here again, as at Okampad, a single great lens of ore, roughly figured to be 3,000 feet long by 500 feet broad, with many smaller outliers, occupies the crest of the range, masses of rich float extending for many hundreds of feet downwards. Six hundred vertical feet were measured from the lowest observed massive outcrop to the highest. The immediate associates of the ore were seen to be banded quartzites and quartz-iron-ore rocks, with abundant rather basic holo-crystalline rocks, this time recorded in the field notes as a variety of charnockite. The lower ground to the north-west was again seen to be completely occupied by granite.'

Here, then, was the supply of iron finally selected; but it was in the hills, far from coal and water, and a search had to be made elsewhere for a site for the works. Mr Perin and Mr Weld at first chose Sini, a junction on the Bengal-Nagpur Railway, about 60 miles north-west of the Gurumaishini Hill. It was considered that the iron-ore, coal, and limestone could be assembled there at low transit charges. Sir John Hewett, who was at that time at the head of the newly formed Department of Commerce and Industry, gave the project every reasonable encouragement. On behalf of the Government of India he undertook to build a railway from a point on the Bengal-Nagpur Railway to Gurumaishini. His original desire was to carry the line right through to the East Coast Railway, through Chaibassa-Chakardapur, and this proposal was warmly supported by the Maharajah of Mourbhanj, the whole of whose state would be thus traversed. The survey of the route was begun, and the Tatas very soon pointed out that the alignment chosen would add ten unnecessary miles to their haulage. The Government

readily agreed not to charge haulage for the ten extra miles. Then came the question of gauge. The Government wanted to build a narrow-gauge line, and to this Mr Dorabji Tata agreed, but later he went to Calcutta and was fortunate enough to persuade the authorities to construct the line on the broad gauge. Reduced rates of freight on the line were promised, and the Government further undertook, subject to certain precautionary conditions, to purchase from the proposed works, at import prices, 20,000 tons of steel rails annually for ten years. The idea of carrying the line right through the state of Mourbhanj was ultimately deferred; but the survey was completed to Gurumaishini, and the Government announced that it would begin building the line as soon as Messrs Tata Sons and Co. had formed the undertaking into a Company, and when the share capital had been subscribed, and 60 lakhs of rupees (£400,000) had been paid up. Meanwhile the firm, through Mr Dorabji, who was then in London, had entered into communication with various persons prominent in the iron and steel industry in England. The idea was that most of the capital should be raised in London, and it was felt that as a preliminary some English opinions upon the character of the iron deposits and the prospects of the scheme should be obtained. On behalf of a group of London financiers interested in the scheme Mr Charles J. Stoddart, Chairman of the Parkgate Iron and Steel Company Limited, accordingly visited India, taking with him Mr William Selkirk, an eminent mining engineer of London. Both these experts reported very favourably upon the quality of the ore, satisfied themselves about the immense quantity available, and expressed the view that it could be cheaply converted into pig iron and made into high-grade steel.

At this stage, which was reached in the spring and summer of 1906, the project flagged again. A preliminary prospectus was prepared and submitted to various financial interests in London, but unforeseen

difficulties were encountered. There were differences about the degree of control which was to be entrusted to the representatives of English investors. A disposition seemed to be manifested to sweep the Tata firm aside. Far more disconcerting was the lack of interest shown by the London Money Market, which is always ready to pour capital into China, or Patagonia, or Timbuctoo, but shows a traditional unwillingness to invest in new enterprises in India. Mr Dorabji and Mr Padshah, acting for the Tatas, had, moreover, come into touch with London during one of its periodical phases of depression. Money was very 'tight', and all fresh projects were looked at askance. The sum asked for was very large. It would have met with a doubtful reception at that moment had the works been projected for England; being for India, people buttoned up their pockets. Eventually there was one exciting period when about four-fifths of the required capital was actually promised; but the Syndicate fell through, and the enterprise again seemed doomed, and Mr Dorabji returned to India.

For more than a year the negotiations were continued in England, but never with more than partial success. By the summer of 1907, however, a new situation had been created in India. The 'Svadeshi' movement, which meant the cultivation of the doctrine that the resources and the industries of India ought to be developed by the Indians themselves, had reached its height. All India was talking 'Svadeshi', and was eager to invest in 'Svadeshi' enterprises. Mr Dorabji and Mr Padshah, who had spent weary months in the City of London without avail, after their return conceived, in conjunction with Mr Bilimoria, the bold idea of appealing to the people of India for the capital needed. The decision was a risky one, and many predicted failure, but it was amply justified by the result. They issued a circular, which was practically an appeal to Indians. It was followed by the publication of a prospectus, which bears the date 27 August, 1907. Mr Axel Sahlin, in a lecture delivered to the Staffordshire Iron and

Steel Institute in 1912, has described the instant response. He says:

'From early morning till late at night the Tata Offices in Bombay were besieged by an eager crowd of native investors. Old and young, rich and poor, men and women, they came, offering their mites; and, at the end of three weeks, the entire capital required for the construction requirements, £1,630,000, was secured, every penny contributed by some 8,000 native Indians. And when, later, an issue of Debentures was decided upon to provide working capital, the entire issue, £400,000, was subscribed for by one Indian magnate, the Maharajah Scindia of Gwalior.'

The prospectus contained the following statement:

'The import of Iron and Steel into India of the classes intended to be produced by the Company has averaged, during the past twelve years, 409,000 tons annually (the imports in 1905-6 amounting to 615,000 tons), and is therefore largely in excess of the capacity of the plant which it is now proposed to erect for an output of 120,000 tons of pig iron and the conversion of 85,000 tons thereof into 72,000 tons of finished steel; there is thus every probability of a ready market on the spot for the whole production.'

It was further stated that the ore-fields, railway, and freight concessions, together with all the other privileges conceded by the Government of India, would be handed over to the Company by Messrs Tata Sons and Co., in consideration of the allotment to them of Rs15,00,000 (£100,000) in Ordinary shares issued as fully paid-up, and Rs5,25,000 (£35,000) in cash to reimburse them for their preliminary out-of-pocket outlay upon the scheme. The latter amount, together with an additional Rs4,75,000 (£31,666) of their own the firm undertook to invest in shares of the Company and not to sell any of these shares for five years. By an agreement entered into between Messrs Tata Sons and Co. and the Company, the firm was to receive a royalty of 4 annas (4d.) per ton of ore 'sold as ore in this country

or exported'. The firm was also to act as agents for the Company for a period of eighteen years, their remuneration being a commission of 5 per cent on annual net profits, after deducting interest on debentures and amount set aside for depreciation, with a minimum of Rs50,000 (£3,333) per year. The directors named were Mr Dorabji Tata, Sir Sassoon David, Sir Cowasji Jehangir, Mr Vithaldas Thackersey, Mr Gordhandas Khattau, Mr Fazulbhoy Currimbhoy Ebrahim, Mr Narottam Morarjee Goculdas, and Mr A. J. Bilimoria.[1]

The capital having been obtained, Messrs Julian Kennedy, Sahlin and Co. were formally appointed construction engineers to the Company. Mr Sahlin had left Brussels for America on 19 October 1907, and he spent seven weeks in planning and discussing the plant with Mr Julian Kennedy and Mr Perin. The plans and specifications of the plant having been prepared, Mr Sahlin sailed for India, and landed at Bombay on 31 January 1908. On his arrival, he found that the site for the works had been changed from Sini Junction to a village called Sakchi, 20 miles away, and about two and a half miles from the wayside station of Kalimati on the Bengal-Nagpur Railway.[2]

The reasons for the change were numerous. It was difficult to secure at Sini the very large tract of land required for the works. The grading of the site and the sinking of foundations would have been very costly. To obtain a sufficient water-supply it would have been necessary to construct a reservoir by damming a stream near Sini. As the stream had an ample flow only for four months in the year, storage would have been required. To provide against the risk of a year of drought, it was considered imperative to construct a reservoir sufficient to supply the works and the community for 600 days. In an early report, Messrs Perin and Weld estimated the probable cost of the reservoir at 4 lakhs

[1] Three of the directors, Sir Dorabji Tata, Sir Vithaldas Thackersey and Sir Fazulbhoy Currimbhoy were afterwards knighted.

[2] The station is now known as Tatanagar.

(£26,666). Mr Sahlin afterwards stated the probable cost at Rs14 lakhs (£93,333). The conclusive cause of the change was, however, that sufficient land was not obtainable at Sini.

Sakchi was accidentally discovered during the surveys for the railway. Its first advantage was that it shortened the distance to Calcutta. Kalimati Station was 152 miles from Calcutta, Sini was 171 miles. Then the new site was considerably nearer the ore-fields at Gurumaishini, though this benefit was partly counterbalanced by the longer haulage necessary for the coal from Jherria. Ample land of a suitable character was obtainable. The crowning gain of the change to Sakchi was that an unfailing water-supply was furnished by the Khorkai and Subarnarekha Rivers, which have never been known to run dry. The name Subarnarekha means 'gold-streaked', and at one time gold was found in the river bed. The river is the largest stream in the district of Chota Nagpur.

Some difficulty was experienced in obtaining the consent of the Government to the change, but the obstacles were soon smoothed away. The chief trouble was the question of the railway to Gurumaishini. The earlier proposal had involved hauling the ore for nearly 20 miles over the main line of the Bengal-Nagpur Railway to Sini. Mr Dorabji Tata now asked for the construction of a direct line from Gurumaishini to Kalimati, with a short connexion from Sakchi to the main line at Kalimati. The length of new line thus proposed was shorter by 10 miles, being 40 miles instead of 50. To this proposal the Government agreed, with the odd proviso that the haulage of 40 miles from Gurumaishini to Kalimati was to be charged as 50 miles. Notwithstanding this stipulation, it was found that the total cost of assembling the materials at Sakchi would be appreciably lower than at Sini. The Government further acquired 5 square miles of land in perpetuity at Sakchi, which area was handed over for the site of the works. The Company leased in addition about 18 square miles from the

Dhalbhum Syndicate, the owners of an adjacent zamindari property, the lease being for twenty-three years. The reason for the acquisition of so much extra land was that it was considered necessary to have the power to prevent undesirable characters from settling within easy reach of the works. All the land thus dealt with was of undulating character, mostly covered with thin jungle, and possessing few inhabitants. Most of the dwellers in the neighbourhood were Santals, a still primitive tribe. The original village of Sakchi still stands on the road from the works to the pumping-station at the edge of the river, and is a small settlement of the type usually found in Bengal.

Mr Sahlin, having seen and approved of the new site, lost no time. The first stake was driven on a plateau at Sakchi, 535 feet above the sea, in the midst of jungle, on 27 February 1908. It was found that the plateau was everywhere underlain by mica schist, affording cheap and good foundations for the new works. The locality is extremely picturesque. From the works as they stand today one looks across the Subarnarekha at the lofty hills of the Manbhum district, and marvels that such forest-clad heights should be so little known to the tourist. The highest peak in Manbhum is over 3,400 feet high, and several lesser eminences are within an easy distance of Sakchi.

From February until April Mr Sahlin remained at Sakchi, and then he handed over the task of supervising the preliminary preparations for construction to Mr Renken, who acted as Resident Engineer on behalf of the firm of Kennedy and Sahlin. All that summer the earlier stages of the undertaking were pressed forward. The site of the works was graded, brickworks were established, large quantities of lime were prepared, railway sleepers, sand, and building stones were collected. Rough bungalows were built for the construction staff. The town was laid out, roads constructed and linked up with the railway station at Kalimati. The branch railway to Kalimati was begun. Above all, the waterworks

were laid out and were in steady progress by the autumn. A good deal of this work was done by Mr Godbole, a retired Engineer from the Bombay P.W.D., but it was completed by Mr Renken, who took over the charge from him later.

Though the water-supply was derived from the Subarnarekha River alone, the Sakchi works lie in an angle formed by the junction of that stream with the River Khorkai. The first necessity was to throw across the Subarnarekha a low dam about 1,200 feet long, in order to bank up the river water to get suction for the pumps. On the edge of the river near the dam a powerful pumping-station was built, containing two pumps driven by an electrical current supplied by the power-house at Sakchi. The level of the river is about 140 feet below that of the works, and the intervening distance is nearly 2 miles. The water is pumped through a 30-inch pipe-line into a reservoir which adjoins the works. The reservoir was formed in a small natural valley on the site, across which a dam about half a mile long was constructed. The area of the reservoir is about 64 acres, it has a depth which at one point reaches 67 feet, and it holds about 256½ million gallons of water. The water is taken by other pumps into the works, returned along shallow cooling ditches into the reservoir, and used again and again. Even if the river temporarily ran dry, there would thus be ample water available.

The actual construction of the plant was begun in the autumn of 1908, and the foundations were started in May 1909, though not much was visible above ground until after October 1909. The first iron was made on 2 December 1911. To include in this chapter a long technical description of the work done during the years of construction would be both wearisome and out of place. The romantic story of the steps which led to the establishment of these huge iron and steel works at Sakchi has been set forth at great length. Those steps were initiated and guided by Mr Jamsetji Tata until the whole project began to take definite

form. He it was who selected the experts to whom the technical decisions were entrusted. He it was who handed over to his sons and their associates the task of direction. From the fortune he had amassed came the funds upon which the undertaking in its earlier stages depended. The whole organization was due to his vision and insight, and bears today the stamp he placed upon it. But it only came to fruition years after his death.[1]

Mr Fraser picks up the story again at p. 202.

CHAPTER X

JAMSHEDPUR

In December 1911, Mr Lovat Fraser, who is responsible for the earlier chapters on the Iron and Steel Works, visited Sakchi. He found that the manufacture of iron had already been begun, and saw a city in the making. 'The town,' said he, 'seemed a model for all great industrial enterprises, not only in India, but in any part of the world where land is easily obtained. I walked,' he continues, 'through street after street of commodious one-storey brick houses, all well ventilated, all supplied with running water and lit by the electric light. Many of the houses possessed electric fans. The larger bungalows, built for the use of the European staff, stood in the midst of garden plots. The streets were wide and well made, and were planted with trees. In the centre of the town was a spacious recreation ground, and it fell to my lot to witness the Christmas athletic sports. There was a bazaar containing both European and Indian shops. Institutes had been provided for both European and Indian workmen. A court-house, a post- and telegraph-office, and a police-station were among the adjuncts of this extremely modern town. I saw the hospital and the schools, both well-equipped.'[1]

Since these lines were written several years have elapsed. The story of the transformation of Sakchi is indeed full of romance, for the foundation of the Iron and Steel Works involved the erection of a new city; not in some industrial centre, close to all the accessories which make building an easy matter, but in a remote and almost unknown district, far from any large town. Sakchi, the original site, was but a village in the jungle, the home of a few primitive peasants. Now it is obliterated

[1] Lovat Fraser, *Iron and Steel in India*, p. 63.

PANORAMIC VIEW OF THE STEEL WORKS, JAMSHEDPUR

facing p. 196

by Jamshedpur, which already houses some 80,000 inhabitants, and is connected by a line of its own with the railway running between Calcutta and Bombay.

From the time of driving in the first stake the Iron and Steel Company assumed the functions of a municipality. There was neither mayor nor corporation, but Sir Dorabji Tata, who, at the New Year of 1910, received the honour of Knighthood, acted as Chairman of the Company, and he and the Directors planned out the place. Within ten years they had spent some 25 lakhs of rupees (or more than £166,000), and at the present time upwards of one and a half crores of rupees (£1,000,000) have already been expended.[1] The Company provided dwellings, built roads, supplied the place with pure water, with drainage, lighting, schools, hospitals, burial-grounds, land for churches, and all that is needed for the creation of a town. Everything is done upon the most modern lines. The Company have built large water-works, where filtration is economically carried out. They have also constructed septic-tanks for the water, and have carried out experiments in sanitation, though the drainage schemes are yet to be completed. The most modern process of sewage disposal has been adopted with excellent results, and the effluent is distributed upon a dairy- and vegetable-farm.

Much of this was done while the works were in course of construction, and the workmen were still housed in *chawls*, but as soon as the Company had time to look round, they appointed a committee to make suggestions for the welfare of the workers. This distinguished body of sociologists included Mr and Mrs Sidney Webb, Professor L. T. Hobhouse, and Professor Urwick, of London University. They laid down a programme

[1] The expenditure on housing amounts to £500,000; on various municipal activities, such as sanitation, water-works, etc., another £500,000. Roads account for £26,000; drainage and sanitation, £90,000; water, £85,000; and the remainder is distributed over lighting, markets, offices, shops, and other necessaries. The municipal upkeep of the town costs about £50,000 a year, exclusive of interest and sinking-fund charges.

on scientific lines. By degrees the rough places were made smooth, and the village in the jungle was transformed into a modern industrial town.

In the Company's hospitals the patients are now tended by fourteen doctors. During the past year no fewer than 440,000 patients received attention, for all the employees and the villagers from the surrounding districts are treated free of charge. A segregation shed has been built for those suffering from infectious diseases. Medical relief forms the chief item of annual expenditure, and next to it comes education, which costs close on £5,000 a year. There is a high school for boys, and a middle school for girls; there are three night schools, a technical school, fourteen primary schools, and four private primary schools. At the new Technical Institute some fifty students are undergoing a three years' course of training in metallurgy and allied subjects: those who complete the course are then offered employment in the works, and some of the most promising may be sent abroad for further study. Recreation, too, receives proper attention. The Company has built a fine Social Institute for the employees, containing a concert hall, billiards- and reading-rooms.[1] A bowling-alley, playing fields for cricket, lawn tennis and football are near at hand.

Everything has been done for the convenience of the inhabitants, who are considered in every way. The cost of police protection is now shared with the Local Government. Motor-omnibuses, available for the public, meet the trains at Tatanagar, 3 miles distant. Numerous other benefits for the general welfare of the town are under the Company's control. They employ a Public Health Officer, whose business it is to look after the welfare of the population, and to inspect the drains, the lavatories, the slaughter-houses, and the food in the markets. The activated sludge-sewage disposal works are the first of their kind in India, and the resulting fertilizers have increased the crops twenty-fold. There is a dairy-farm, which not only affords an outlet for the

sewage, but supplies about 30 per cent of the needs of the town, and helps to regulate the price of milk. It is intended, in time, to increase the farm to 1,000 acres, and when the full drainage scheme has been completed it will be possible to irrigate about half the land. The Company also superintend the consumption of liquor. They have their own ice and soda-water factory, where the daily output is 17·5 tons of ice, and 12,000 bottles of soda-water, provided to the workmen free of charge. Provision is made for the distribution of grain at cost price.

So rapid has been the growth of Jamshedpur, that it still lacks the status of a municipality which such a place demands. The industry did not develop round a town, but brought along a town in its wake. Such a position is perhaps unique, at any rate for a community of over 70,000 souls, a figure which would, in England, carry with it the dignity of a county borough. It was necessary, within a few years, to spend a large amount of money, and the only power which could do this was the Tata Company. There were no municipal debentures to cover capital expenditure, no governing bodies to frame bye-laws. Jamshedpur was the creation of a firm, and sprang up, as it were, in the night. There were no taxes to pay for roads and drainage, water-supply and lighting, nor was it possible to make the annual up-keep of the place a charge upon the inhabitants. At first all the capital expenditure fell entirely upon the Steel Company, but the establishment of seven associated Companies has enabled this state of affairs to be remedied. Each of the new Companies contributes its quota, in proportion to the extent of its buildings and its pay-roll. As they assist in providing the capital necessary for further expansion, so they share in the administration, and with the Tata Company at their head they keep control of the administration. But the constitution is not wholly an oligarchy. A Municipal Committee, composed of representatives of the Companies concerned, and of a certain number of

public representatives, now has some say in the local government. At present the Committee administers the area of Jamshedpur, but it will probably, at no distant date, obtain powers to pass statutory bye-laws, and will then resemble an ordinary Municipal Board. The task of furnishing opportunities for recreation, which formerly fell upon the Tata Company, is now being taken over by individuals and associations. The Municipal Committee has already provided further playgrounds, a race-course, and a band, which performs in various parts of the town. Literary, dramatic, sporting, and football clubs are numerous, and indicate that Jamshedpur is the centre of an active civic life, conforming to the ideals of the man after whom the town was named.

Such is Jamshedpur at the present day. The town which, sixteen years ago, did not exist, now covers an area of 25 square miles. About 30 miles of good metalled roads intersect the town, and 60 miles of unmetalled roads have been made in the neighbourhood. The Company alone owns 4,500 houses, which vary in rent from about one rupee to Rs100 a month. But it is the huge works which form the most striking feature of Jamshedpur. On every side are the appurtenances familiar to Englishmen living in the 'Black Country': boiler and power houses, machine shops, pattern shops, and foundries; the great blast furnaces, and the tall chimneys of the Steel Works. Where, in recent years, there was nothing to be heard by day but the quiet sounds of the country-side, there is now the constant clang of machinery; and at night the darkness, which formerly covered the land, is broken by the steady glow of great furnaces.

The works as originally constructed had a potential output of 160,000 tons of pig iron and 100,000 tons of steel: considerable extensions have since been made, but the comparatively small and self-contained plant, as first laid out, is still operating today. In 1911 there was all the necessary equipment for the production of rails, beams, bars, and sections. A well-fitted foundry

and machine-shop were provided for ordinary repairs and the maintenance of the plant. The coke for the blast furnaces was produced in 180 non-recovery Coppée coke ovens, having a combined capacity of 1,400 tons every ten hours, the charging lorries, coke-pushers and levellers all being electrically driven. The blast-furnace plant originally consisted of two furnaces, 77 by 19 feet, equipped with double-skip hoists and four Cowper-Kennedy hot-blast stoves, the iron being run into ladles for the steel plant, or cast into pigs. The boiler plant consisted of Babcock and Wilcox boilers, each of 500 horse-power, partly fired by surplus gas from the blast furnaces and supplemented by hand coal firing. Blast for the blast furnaces was provided by three Zoelly type turbo-blowers. The original power-house was equipped with three turbo-generators coupled direct to Zoelly type turbines, three-phase current being generated at 3,000 volts, 50 periods. The pumping plant consisted of Sulzer centrifugal pumps for the distribution of water throughout the works, for hydraulic pressure, boiler feed, and for town service. The steel plant was housed in a building 650 by 135 feet, containing one 300-ton gas-fired mixer, four 40-ton basic open-hearth furnaces, and three five-hole gas-fired soaking pits. The open-hearth furnaces were subsequently enlarged to 50 tons capacity. Two 75-ton cranes are installed on the casting side of the open-hearth plant, ingots being cast in moulds standing on trucks. An installation of sixteen Morgan mechanical gas-producers provided gas for firing the open-hearth furnace. The rolling-mill plant consisted of a 40-inch blooming mill driven by a three-cylinder Ehrhardt and Sehmer engine. At the opposite side of this engine was installed a 28-inch two high reversing rail mill with three stands of rolls served by travelling transfer tables. The product is delivered along a line of live rollers to the hot saws and the finishing department. Adjacent to the rolling-mill buildings is an ample and accessible stockyard for storing the various products of the mills. There are also provided a store-house and

pattern-maker's shop, blacksmith's and general shop, and chemical and physical laboratories, for the staff as well as for the Government Inspector. The mill buildings throughout were placed due east and west, with protected gables and open north and south elevations. This arrangement provides continuous shade in the interior, as well as free ventilation. The building frames are of steel of heavy design, with roofs of corrugated iron. An elaborate railway system gives ready access to all parts of the works and the yard; locomotives and cars for hot metal, slag, and waste material, ingots, pig iron, etc., are owned by the Steel Company.[1]

The principle laid down for manning the works was that labour-saving machinery should be used wherever possible, and that in any case there should be no repetition of the excessive demands upon the strength and endurance of the workmen which have marred the early history of other industrial enterprises in the Indian sub-continent. The original scheme provided a normal operating crew of about 2,000, of whom about 175 were to be Europeans. At the time of Mr Fraser's visit Sakchi was an extremely cosmopolitan place. Mr Wells was General Manager, and his chief assistants in the management, as well as the Blast Furnace Superintendent and his staff, were all Americans. The crew of the steel works and their superintendent were Germans. The superintendent and crew of the rolling-mills were English. The clerical staff was chiefly composed of Bengalis and Parsees, and there were a few extremely efficient Parsees in the various mechanical departments. There were a certain number of Austrians, Italians, and Swiss, while Chinese were working as carpenters and in the pattern-shops. This medley of nationalities did not always work very well together. 'I recall,' says Mr Fraser, 'that at the athletic sports I witnessed there was a fierce quarrel about a tug-of-war between

[1] The succeeding paragraphs up to the end of Lord Crewe's visit have been incorporated, except for a few verbal alterations, from Mr Fraser's *Iron and Steel in India*.

German and American teams. The Americans complained that just when they were winning, the Germans, taking advantage of the darkness which had suddenly come on, slipped extra men upon their rope, in order to obtain a victory by unfair means. The squabble was ultimately settled by Sir Dorabji, who was acting as referee, deciding that the event should be settled the next morning by daylight, when the Americans won easily. Eventually the crews of European workmen were somewhat reduced. The American crew worked with conspicuous vigour while they remained. They were mostly from the Southern States, and were accustomed to a 12-hour day. At Sakchi they worked an 8-hour day, and seemed to stand it very well, despite a temperature of 115 degrees in the shade in the hot weather and from mid-June to mid-September, a very humid atmosphere, with an average rainfall of 50 inches. The buildings are, of course, especially designed for hot-weather work. Nevertheless, I doubt whether the American crew could have kept up their energy for several years.'

After Mr Renken had made considerable progress with the preliminary work, Mr R. G. Wells arrived in 1909 and took over charge as General Manager. Mr Wells was an American, who specialized in the construction of iron works. His experience included prolonged periods of work at Mariopols, in Russia, and at the Dominion Iron and Steel Company's works in Sydney, Nova Scotia. When he reached India, the new centre of industry was still only slowly emerging from the surrounding jungle. It was largely owing to his and Mr Sahlin's energy and driving-power that the works were actually built in considerably less than three years.

Both Mr Julian Kennedy and Mr Sahlin happened to be at Sakchi during Mr Fraser's visit. Mr Kennedy informed him that there had been fewer labour difficulties there than in any plant with which he had ever dealt. Sakchi is on the edge of the district from which the tea planters of Assam obtain much of their labour.

The supply of unskilled labour has therefore always been ample. The unskilled Indians are mostly Santals and Khols, who represent the best coolie labour in India. Even before 1911 the Company sometimes had as many as 8,500 people working at Sakchi, and another 10,000 gathering float-ore at Gurumaishini. Mr Wells added to these statements the comment that ' coolie labour is not cheap '. The true test is not the rate of wages, but the amount of work done in a given time. The daily average of people employed at Sakchi during 1912 was 6,300.

Mr Julian Kennedy had then only just completed his inspection of the works, and this was the first time he had paid a personal visit. Mr Sahlin, who accompanied him, had not been out since 1908, but both partners had been constantly consulted. Mr Kennedy was very favourably impressed with the site, and was still more impressed by the cheapness of production. He said: ' To make the ore for a ton of pig iron costs 75 cents here, as against 8 dollars in Pittsburg—that makes a tremendous handicap in favour of this place. No other place is so cheap. Moreover, we can make in $2\frac{1}{2}$ minutes from ingot to rail.' The coal from the Jherria field, 120 miles away, was, he said, brought to Adra, and then down to Sini Junction and Kalimati, and thence by the branch line to Sakchi. The coal was of excellent quality and was low in sulphur, but it was higher in ash than the best American and English coal. With their high-grade ore and high-grade flux they might have had to put into the furnaces some impurity in order to get enough slag to run them, so it was just as well to have a high ash in the coal. The flux for the blast furnaces was dolomite, obtained from Panposh in the Gangpur state, about 100 miles west of Kalimati. The price paid for flux was 6 annas (6d.) per 100 cubic feet. The Company had a limestone quarry at Jukehi, a station on the East Indian Railway near Katni, about 500 miles away, and from this source they obtained the limestone (technically known as calcite) used as the flux for the steel furnaces. At a later date the Jukehi quarry was closed

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and limestone was purchased at the time from Katni. The Dhalli and Lohara deposits of ore, in the Drug area, were being kept in reserve. This ore was somewhat richer than the Gurumaishini ore, and was much lower in phosphorus, a great advantage for the European market, particularly England, where the acid process of making steel is used. Limestone in the furnace forms a slag which removes the phosphorus. In Mr Kennedy's opinion the Jherria fields furnished the only coal suitable for metallurgical coke. It takes $1\frac{1}{2}$ tons of coal for a ton of coke, and $1\frac{1}{4}$ tons of coke for a ton of pig. Roughly, about $1\frac{7}{8}$ tons of coal are required for a ton of pig. Mr Kennedy expressed the view that the manganese mine which the Company possessed at Balaghat, close to the Bengal-Nagpur Railway line, would be able to produce ore very cheaply when the railway was carried to the mine. Only about 6,000 tons of manganese were required annually at Sakchi, and the rest of the production would be available for export. The railway connexion to Balaghat, a length of 32 miles, has since been completed, and Mr Kennedy's prediction about cheapness of production has been amply realized.

The Sakchi works soon became a recognized place of pilgrimage for prominent officials, and for distinguished visitors to India who sought proof of the country's capacity for progress. Perhaps the first important visit was that paid in July, 1911, by the members of the Indian Mining and Geological Institute. At that time no iron had been made, but the visitors were much struck by the labour-saving devices already installed. One glowing record of the visit notes the following:

'Of labour-saving devices the coke ovens and the coal-crushing plant furnish a fine example. The coal is carried mechanically into the crushers, and having been so pulverized that the proportion which will equal the size of a pea will be less than 1 per cent, it is shot up into an elevator, from which it is discharged into wagons for conveyance to the coke ovens. Seventy tons of coal can thus be handled and crushed in an

hour. The ovens can turn out 500 tons of coke in twenty-four hours. The rams which drive the coal into the ovens, the levellers by which the coal is spread inside the ovens, and the pushers by which the coke is ejected from the ovens are all electrically driven, and the coal is scarcely touched by human hands from the moment of its arrival from the Jherria coal-fields to the time when it is shunted to the blast furnaces yard.'

The speech delivered on this occasion by Sir R. P. Ashton, the President, is worth preserving. He said:

'Midday in the rains in Chota Nagpur is not the place to make a long speech, but it will be your wish that I should express the hearty thanks of the Institute to Messrs Tata and Sons, the Iron and Steel Company, and to Mr Wells, for the hospitality, the instruction, and the inspection of their titanic enterprise, that we have enjoyed today. Surely there has been seldom in history so interesting an enterprise as that which we have seen. It had its origin in the great brain of one who, alas, is no longer alive to see its fruition—the brain of the late Mr Jamsetji Tata. . . .

'In the gentlemen that we have met here and the plant that we have seen, men and material sent are represented by the greatest engineers of England, Scotland, Wales, America, Canada, Germany, Belgium, Switzerland, and France, and the men and material are worthy of their senders. Not a rivet nor a bolt or sheet in that group of immense structures which have so impressed us with their latent energy but is the embodiment of work and thought which is focussed in this wild valley, to melt for man's use a great hill of ironstone that has been waiting for ages some 40 miles from here. Then this enterprise is planted in what a few years ago was one of the wildest spots of India, and where even at this moment the naked hunter with his bow and arrow, the tiger and the bear may be looking from the surrounding hills at the latest outcome of engineering genius. In a few months it is expected that a fire will be lighted which will not be extinguished till

the Gurumaishini hill has been melted into railway materials, beams, sheets, which will be so much material to open up this country, to traverse its rivers, house the people, and to bring India forward into line with the most advanced of countries. May the fires soon to be lighted here not only turn stone into rails, but help, as all sound industry does, to develop the people, among whom it is planted, into props and girders of civilization, as useful as the British, American, and German nations, who have given them the Tata Iron and Steel Works, and sent Mr Wells to erect and start them.'

It had been hoped that His Majesty the King-Emperor during his progress through India in the cold weather of 1911–12, on the occasion of the Imperial Coronation Durbar at Delhi, would have been able to visit the Sakchi works. The great programme of festivities arranged at Calcutta rendered these hopes vain, but in His Majesty's stead Lord Crewe, the Secretary of State for India, visited Sakchi on 6 January, 1912. The following record of an occasion which will always be memorable in the history of the Tata enterprises was afterwards published in the *Times of India:*

'Since his arrival in India, Lord Crewe, Secretary of State and Minister in attendance on the King, has received no deputations and made no speeches, yet he has been assiduous in his efforts to ascertain the real trend of affairs in this country and to come into contact with people of every shade of opinion. If the first visit of a Secretary of State for India to this country has not bulked large in the public eye because of the simultaneous presence of the King, still Lord Crewe will leave Bombay with a varied store of valuable impressions of the land for whose good government he is responsible to Parliament. On Saturday, however, he made a slight departure from his practice. He accepted an invitation from Messrs Tata and Sons to visit their iron and steel works at Sakchi, and advantage was taken of this occasion to invite a number of officials and others to the blast furnaces and steel house set up in the jungle. Sir Dorabji

Tata, Chairman of the Company, arranged for a special train to leave Howrah at 8 o'clock. Amongst those who accepted his invitation to be present were Lord Crewe, the Hon. Mr Clarke, Member for Commerce and Industry, and the Secretary of the Department, Mr R. E. Enthoven, Sir James Meston, Secretary of the Finance Department, H.E. Rear-Admiral Sir Edmond Warre Slade, Sir Thomas Holland, who greatly assisted the Company in its early days, the Hon. Mr Gokhale, Mr Harold Cox, Sir Frederick Dumayne, Deputy Chairman of the Calcutta Port Commissioners, and Sir R. N. Mukerji, of Messrs Martin and Co. Mr Ratan Tata, Sir Shapurji Broacha, and Sir Vithaldas Thackersey, of the Directing Board, were also of the party. It was a journey of a little more than four hours from Howrah to Kalimati, and as breakfast was served *en route* the short run was pleasantly performed. The route lay through the rice-fields of Bengal, now bare even of stubble, for the grain has long been harvested, then into the hills and jungles of Chota Nagpur, giving, as Kalimati was approached, a glimpse of Gurumaishini, whence the Company draws an unlimited supply of the highest grade iron-ore. At Kalimati the Company's engine was attached to the 'special' and hauled it over the short branch which leads from the main line to the works, and drew it up just outside the blast furnaces, where there were present, amongst others, the Hon. Sir Fazulbhoy Currimbhoy and Sir Cowasji Jehangir, and Mr R. G. Wells, the General Manager of the works, who acted as cicerone.

'As soon as the guests were assembled the cast timed for their arrival was begun. There are two blast furnaces at the works, one of which has been in operation for the past month. Their bases, so far as they are visible above ground, rest on a raised platform, the floor of which is a bed of sand. Down the centre of this floor ran a broad channel with high banks, and on the right side stood the serried rows of moulds ready to receive the liquid metal and shape it into pigs. The foreman

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of the blast furnace gang, an American of splendid physique, seized a long steel rod and vigorously attacked the clay stopping which sealed the exit from the furnace. The baked clay soon gave way before his vigorous strokes, and first a feeble trickle, then a rushing stream of molten iron gushed out, throwing up a cloud of starry sparks which at night produce a pretty pyrotechnic display. Just outside the furnace the molten iron was dammed up, so that the ash might be led away if necessary, then it flowed down the blast house till it turned right-handed by the bottom row of pig moulds. As these were filled one workman tore down the inner bank of the sandy channel, another arrested the flow of iron by thrusting a broad-bladed shovel in the current, and so the second row filled. This process went continuously forward until the flow of iron weakened, then ceased, and between 45 and 50 tons of smoking incandescent pig-iron lay on the floor. Immediately the mud gun was swung round to the front of the furnace—a steel cylinder with a ram worked by steam terminating in a nozzle. The nozzle was thrust into the furnace hole, the gun was charged with balls of fire-clay; and plunk, plunk, to a hissing accompaniment the plugs were rammed home till the sealing was completed. Then the blast which had been partly shut off was let loose; you could hear the rattle of the skips as they carried the ore and coal and flux to the furnace top and plunged them into the raging cauldron within, and all was relative peace. The furnace had renewed its unending task—to receive its charge of raw material and convert it into liquid form, until in another six hours or so it would be ripe for another tapping, by which time the pigs on the floor would have been carried off to the store and the floor prepared with another series of moulds.

'This was as far as the guests were able to witness the actual process of manufacture, as the steel works are not quite ready. When they are in operation, which will probably be next month, very little iron

will be converted into pig, and the molten metal will be carried direct in great ladles to the steel house, where it will be poured into a 300-ton mixer and thence diverted into one or another of the open-hearth steel furnaces, when, with the cycle of manufacture complete, the iron will never cool from the time it leaves the blast furnace until it is carried, a finished rail or shape, to the storeyard. These other processes for the moment have to be taken on trust. A fascinating hour was, however, spent in inspecting the processes subsidiary to the making of iron and the works which will ultimately convert it into steel. They saw the bins where the ore from Gurumaishini and the flux from the Central Provinces are stored, and the coke ovens which take the coal from Jherria and turn out a coke of excellent quality. They saw the bins automatically drop the charges into skips running up an inclined way, and tip their contents into the furnace, which is so tightly sealed that none of the gases escape, but are harnessed to utilitarian purposes. Some of them are carried off to the four stoves which heat the blast, and so effect the great economy in fuel which makes the production of cheap iron possible. Others are carried away to the water-tube boilers which generate the steam driving the turbo-blowers for the blast and the turbo-generators for the electric-power, which is the maid-of-all-work. Indeed, a modern blast furnace recalls Max Adeler's ideal of every pig his own sausage maker, for the gases from the furnace produce the power which creates the blast and heats the blast, so that it can do its work cheaply and well.

'Then they passed into the steel house, the largest building of its kind in Asia, where the "mixer" acts as a balancing reservoir between the blast furnaces and the steel works, where four furnaces are almost ready to begin the process of steel-making, where the gas-fired soaking pits are to heat the steel ingots to a uniform temperature in readiness for the "blooming" mill. And so to the rolling-mill, where the 12,000-

horse-power engine was running the rolls which on one side will reduce the ingot to the short lengths which are technically termed blooms, and on the other will roll the blooms into rails or whatever structural shapes may be demanded by the market. Lord Crewe, who was specially interested in these processes, for he is an iron-master himself, was driven off to the model township where the European and Indian staffs are housed, and the others passed through the fine machine shops and foundries which make the works self-contained.

'The visit made a deep impression on all who were present. They admired the courage which has planted a steel city in the jungle and raised a crore and a half of rupees in order that India may possess the iron and steel manufacture which is the life-blood of modern industry. They were able to appreciate the careful scientific investigation which preceded the stage of construction, and the skill and forethought which have erected in India a plant which embodies the very best modern practice. With this recognition came the earnest and confident hope that those who pioneered and carried to completion this great enterprise may be rewarded by an adequate financial return.'[1]

Since these earlier days the works have developed. With Sir Dorabji as Chairman, and Mr R. D. Tata taking a prominent part in the management, this vast concern has attained to its present stability and strength. Mr R. G. Wells resigned his post, and was at length succeeded as General Manager by Mr T. W. Tutwiler. Since 1912 the average number of daily employees has risen from 6,300 to over 24,000, and in 1921 the average number reached 30,900. There are, in all, 36,000 employees at Jamshedpur. The collieries employ a further 4,500, the iron mines 8,000, the limestone and dolomite quarries another 4,000: a grand total of 52,500, of whom only about 150 are Europeans and Americans. The great increase in workmen has

[1] This concludes the extracts from Mr Fraser's *Iron and Steel in India*.

been demanded by the expansion of the plant. Where there were two blast furnaces there are now five, and the four open-hearth furnaces have been increased to seven. The original output of the works was estimated at 160,000 tons of pig-iron, and 100,000 tons of steel, but the recent extensions will admit of an output of about five times that amount.[1]

There are three main groups of plant: the coke ovens, where the coal is converted into coke; the blast furnaces, where the ore is smelted; and the steel works, where the finished product is produced. The Coppée coke ovens comprise a battery of 180 non-recovery ovens with the necessary equipment for the crushing of coal, 50 Kopper's by-product coke ovens, 150 Wilputte recovery ovens, as well as a by-product plant for the recovery of coal-tar, the manufacture of sulphate of ammonia, and ultimately the recovery of benzol. There is also a Simon Carve sulphuric acid plant with a daily capacity of 32 tons of acid. Extensions are provided for, if necessary, without interference with the existing plant.

The blast furnaces are very powerful. The first two measure 77 by 19 feet and 12 feet diameter hearths, equipped with up-to-date charging and weighing apparatus, and four Cowper-Kennedy stoves. The daily output of each of these furnaces is about 350 tons. There are also two new large blast furnaces of 400 and 500 tons daily output. These were purchased in America during the war, when the Ministry of Munitions vetoed such a purchase in Great Britain. The transport of these furnaces, with all their ovens and mills, the loss of material by submarine attacks, their erection and their enhanced cost, provide the most interesting episode in the history of the Iron and Steel Works. The iron produced is found to be of uniform excellence. Part of the pig-iron is conveyed in a liquid state to the steel works, by the aid of 30-ton

[1] Mr H. M. Surtees Tuckwell, *The Iron and Steel Industry in India*, etc., (Proceedings of the Empire Mining and Metallurgical Congress, London, 1924). Also MS. notes by Mr T. W. Tutwiler.

TATA MAIN HOSPITAL, JAMSHEDPUR

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brick-lined ladles, into a 300-ton furnace, known as the ' Mixer ', thence it is tapped out by means of ladles, and charged into the seven 50-ton Siemens-Martin basic open-hearth furnaces for conversion into steel. Three more furnaces of 60-ton capacity, two 200-ton open-hearth tilting furnaces, a 1,300-ton mixer, and two 25-ton Bessemer converters are being installed. It is now estimated that 600,000 tons of pig-iron and 570,000 tons of steel ingots can be produced yearly. After the requisite period, the duplexing will only take two to three hours in the furnace; the liquid steel is cast into ingots, each weighing 2 or 3 tons, which are then conveyed to the three soaking pits placed in the steel works building. The pits are equipped with mechanically operated lids, and an electric overhead ingot-charging and stripping crane. From the soaking pits the hot ingots are passed through the blooming mill, and thence to the finishing mills or the bar mill, where they are rolled to the proper dimensions, cut by circular saws to the required length, and conveyed by rollers to a cooling-bed of the moving type. From the cooling-beds the steel is passed to the finishing department, which is equipped with an overhead electric crane running the whole length of the building, and serving the straightening, planing, and drilling machines.[1]

An important adjunct to the works is a well-equipped Chemical and Physical Laboratory, where both the raw material and the finished products are tested. There is a Government Laboratory in charge of an Inspector of the Railway Board, who supervises the manufacture of the steel on behalf of the railways. There are well-equipped machine shops, shops for pattern-makers, carpenters, and blacksmiths, and shops for the repair of locomotives, electrical repairs, and structural work. Two power-houses have been built. No 1 Power-House is equipped with machinery capable of generating

[1] A more detailed and technical account of the process will be found in the Appendix to Mr Lovat Fraser's *Iron and Steel in India* (Bombay, 1919).

12,500 kw., and No. 2, 25,000 kw. These power-houses contain the various blowing machines and pumps for the different blast furnaces and the other plant, and are equipped to supply the power for lights and fans, not only through the entire works, but to the neighbouring bungalows. The works are still undergoing expansion. Since 1919 much has been done. The town itself is growing year by year, and subsidiary industries are springing up. As the need arises, new institutions are built in their turn, and within a few years Jamshedpur will be an industrial city of 200,000 souls.[1]

The various raw materials required for this immense concern are drawn from different parts of India. Jamshedpur has coal to the north, iron-ore on the south, and flux on the west, while the Port of Calcutta, 155 miles eastward, renders convenient the import and export of materials. Coal is obtained from the Jherria and Ranygunj coal-fields, 150 miles north of Tatanagar. Parts of these coal-fields belong to the Company, and it is estimated that their property contains sufficient coal to supply the steel works for at least a century, but until this property is developed it has been deemed advisable to purchase a portion of the coal required. In 1922, out of the 846,172 tons consumed at the works, 465,350 tons were hewn in the Company's mines. During the same year the Company produced 417,232 tons of iron-ore, about 67 per cent of India's total production, and this was drawn from their mines at Gurumaishini, Sulaipat, and Badampahar, some 40 to 50 miles from Tatanagar. Further supplies will be obtainable from Jamda, in the Singhbhum District. The necessary chromite comes from Chaibassa, in the same district, which lies within 60 miles of Jamshedpur, but the other raw materials must be sought farther afield. Dolomite is obtained from Panposh in the Gangpur State, 120 miles away; limestone is brought from the Bilaspur district, 250 miles to the west, and from Katni in the

[1] See the Appendix to Mr Lovat Fraser's *Iron and Steel in India* (Bombay, 1919).

Central Provinces. Out of the 732,851 tons of dolomite and limestone mined in India during 1922, the Steel Company extracted 205,895 tons, about 28 per cent of the total production of India. Manganese is also supplied from the Central Provinces, some 500 miles from Tatanagar, and the necessary magnesite is obtained from Kadakola in Mysore, 1,329 miles to the south.[1]

In the development of so great a business the workman has not been forgotten. All the employees have long had the benefit of provision against accident, but after tentative experiments, spread over some years, the Company, in 1920, turned their attention seriously to safety work, and appointed an inspector to ensure the observance of the regulations. A General Committee for Safety, composed of superintendents and representatives from the various departments, is assisted by twenty-three Departmental Committees. Their business is to investigate the circumstances in connexion with fatal accidents, and all cases of alleged neglect on the part of employees, especially such cases as are considered dangerous to life and limb. The General Committee makes recommendations as to the protection of unsafe places; the fencing of machinery; the fixing of proper guards to gears, belts, and pulleys; the covering of electric switch-boards; the erection of danger, warning, and notice boards; the installation of signal lights, and all those devices which serve to protect the workman from that carelessness which arises through familiarity with his daily routine. A special box is kept in the works, in which any employee may place a suggestion, and, if his idea is adopted, he receives a reward. Boards are placed in prominent positions round the plant, on which warning notices are displayed in English, Hindi, and Urdu; in addition, the posters and pamphlets of the British Industrial Safety First Association are exhibited and circulated. The efficacy of these measures may best be judged from the number of accidents, which in 1922

[1] MS. notes by Mr T. W. Tutwiler.

affected only 1·79 per 1,000, among a daily average of 24,120 employees.[1]

When the furnaces at Sakchi had been in full blast for three years the world was plunged into war. Germans who had been in charge of the open-hearth furnaces were at once interned, and their places were taken by an English crew. From August, 1914, until the war ended, the Company supplied the Government with 1,500 miles of rails, and a large amount of material for the campaigns in Mesopotamia, Egypt, Salonica, and East Africa. Nearly 300,000 tons of steel material was provided by the firm.[2] Had the works not existed, these supplies would have been drawn from the United States, and at much greater cost, owing to the higher prices, the exorbitant rates for freight and insurance, and the risk of submarine warfare, with its losses and consequent delay. No fewer than twenty-six vessels were torpedoed while carrying material consigned to Jamshedpur. The losses of machinery and stores cost the Company upwards of £40,000, in addition to a loss of machine tools valued at a further £20,000. One vessel alone, the *Vasconia*, involved the firm in a loss of £12,750. The works could not resume their preparations for expansion until peace had been signed.

Instead of demanding an excessive profit during the war, the Company sold its steel at one-third to one-quarter of the price which it would have realized in Calcutta. It was the same with pig-iron, of which some 4,000 tons were sold to the Government at Rs11 a ton below the price of the Cleveland iron, without even taking into account the additional freightage, insurance, and other charges involved in transport from England to the East. Profitable as was pig-iron at the time, the Company, on realizing the urgent need for steel, added two more open-hearth furnaces to its steel plant, and converted most of its output of iron

[1] MS. notes by Mr T. W. Tutwiler.

[2] Indian Tariff Board: *Evidence on the Steel Industry* (Calcutta, 1924).

FOUNDER'S DAY CELEBRATION, JAMSHEDPUR

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into steel. In 1916 the Company, for the first time in India, made ferro-manganese, an essential alloy in steel manufacture, and sold it in America, for some months, at a profitable price. But with a loyal determination to help the Government, the Tata Company agreed not to manufacture this alloy, and utilized the blast furnaces for making pig-iron, a sacrifice by which, from one furnace alone, they relinquished a profit of upwards of 10 million rupees. During the war the Tata steel was supplied at controlled prices, not only to the various expeditions, but to the Indian Railways, and to the Military and Civil Departments of the Indian Government. Had no more been done, the Company would have rightly earned the gratitude of the country, but in addition to sacrificing their profits they subscribed Rs57,75,000 to the Indian War Loans, and their employees contributed Rs3,48,900. Little wonder that the Viceroy acknowledged the services of a Company which can boast of the largest output in the commonwealth, and pays, directly or indirectly, over 50 lakhs every year into the Indian Exchequer.[1]

On 2 January 1919, Lord Chelmsford visited the Iron and Steel Works. He was received by Sir Dorabji Tata and some of the directors and officials. After visiting the shops and the different institutions, His Excellency, in the course of a brief speech, renamed the town 'Jamshedpur', in honour of the man who introduced India to her own enormous resources of iron. 'This great enterprise,' said the Viceroy, 'has been due to the prescience, imagination and genius of the late Mr Jamsetji Tata. We may well say that he has his lasting memorial in the works that we see here all round.'[2]

More than twenty years have passed since Mr Tata last discussed his scheme with Lord George Hamilton. Nine years later Lord George wrote to the son: 'If you can establish a reliable steel industry in India

[1] Indian Tariff Board: *Evidence on the Steel Industry* (Calcutta, 1924).

[2] Lovat Fraser: *Iron and Steel in India.*

you will revolutionize for the better the industrial conditions of India.' After congratulating Sir Dorabji on his success in raising the capital in his own country, Lord George continued: 'So soon as they [the investors] can obtain a satisfactory return from industrial enterprises which in their initiative, development and production are entirely Indian, there will be a general inducement to embark on other forms of industrial production. Wages will rise, and the whole material condition of the population will improve. It is for these reasons that I took so much interest in the big schemes which your father elaborated to me, and I congratulate you upon carrying out with such success the ideas of your father.'[1]

[1] Lord George Hamilton to Sir D. J. Tata, 4 October 1911.

CHAPTER XI

THE HYDRO-ELECTRIC SCHEME

TOWARDS the end of his life Mr Tata became associated with a further scheme for developing the industrial resources of Bombay. The diverse interests of his firm had given him widespread connexions in the world of industry and finance. Since the opening of the Empress Mills he had rarely looked back. His life was apparently full. The plans for the Institute of Science were slowly making headway; but though its founder had in hand the iron and steel project as well as his various experiments in reclamation and sericulture, he was always prepared to examine any new venture.

He could do so the more readily, since his sons and his lieutenants had helped him to build up a firm fitted for expansion. Mr Tata possessed a gift, which amounted to genius, for selecting the right subordinates, and throughout his life he exhibited to a notable degree the art of delegating much of his work. He kept his fingers lightly upon the pulse of a business: there was no fuss, no unnecessary worry. When he once devoted his mind to further expansion, he could call upon that reserve of time and energy which only a great organizer can keep at his disposal.

Though already subject to severe attacks of illness, he did not hesitate in taking up the hydro-electric project, which eventually became one of the firm's largest undertakings. To him, however, the use of water-power was not a new interest. As early as 1875 he had contemplated the development of India's hydraulic energy in connexion with the manufacture of cotton. While looking for a site on which to establish the Empress Mills, he surveyed the falls at Jubbulpore, where the Nerbudda River rushes between the famous marble

rocks.[1] He actually negotiated for the purchase of the necessary land, and when the negotiations fell through, he retained his interest in the possibilities of hydraulic power, though twenty years elapsed before he was able to give it shape.

In 1897 Mr Robert Miller, a member of a well-known firm of Bombay merchants, obtained an option of purchasing the rights over the Doodh-Sagar Falls, which lie outside the British boundary, in Portuguese territory. He came for assistance to Mr Tata, who at once suggested the employment of a competent engineer, Mr David Gostling, to make an exhaustive report upon the possible use of the power for commercial purposes. The report was favourable, and within a few weeks Mr Tata, Mr Miller, and Mr Gostling joined in the formation of a small syndicate.

The plans of the syndicate were barely framed, before Mr Gostling came forward with another proposal. It had been his custom to spend some months of the year at Lonavla, a hill station on the Western Ghats, 2,000 feet above Bombay. He had noted the physical characteristics of the district; the contours of the surrounding valleys, the substance of the soil, and the sharp gradient of the slopes. He came to the conclusion that the configuration of the land provided an excellent catchment area, and that the storage of the rains could furnish a considerable portion of the energy required to drive the mills of Bombay. Encouraged by the success of a scheme at the Cauvery Falls, Mr Gostling expounded his ideas to Mr Tata, who immediately grasped their great possibilities. The Doodh-Sagar Syndicate was temporarily set aside, and attention was concentrated upon this more promising area.

To a mind like Mr Tata's, the hydro-electric project made a strong appeal. He had experienced the value of the electric drive in his own mills, and welcomed power, which would make industry less dependent upon costly coal, and purify the atmosphere of the city. For

[1] See p. 25. At that time, of course, hydro-electric energy was not contemplated.

THE WALWHAN DAM

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over ninety days in every year the saturated winds of the south-west monsoon sweep up from the Indian Ocean, depositing their moisture upon the scarp of the Western Ghats. Within 50 miles of Bombay the hill-tops are drenched by one of the heaviest rainfalls in the world. At the summit of one of the hills in the catchment area as much as 546 inches had been measured during a single monsoon. It was estimated that, for the generation of electric energy, the volume of water flowing to the sea would be more than adequate to furnish as much power as Bombay would require for her mills. From storage lakes in the upper valleys it could be carried to the edge of the plateau at Khandala, and forced through gigantic pipes to the foot of the Ghats at Khopoli. The dams were to be handsome and impressive monuments of the development of India's engineering.

As soon as the preliminaries of the scheme had been formulated, Mr Tata approached the Government in order to secure priority for the necessary concessions: the acquisition of the land, and the licence needed for a public project. Before taking any definite steps, he went to London and saw the Secretary of State for India, Lord George Hamilton, to whom he expounded his schemes, particularly the steel and hydro-electric projects. Lord George was decidedly sympathetic, and on returning to India Mr Tata found that the support which he had evoked proved a valuable asset. Before the syndicate could be definitely launched there were two important points to be settled. One was the acquisition of the necessary rights over the land, the other was the formal recognition of the new venture. It was necessary that the Bombay Government should permit the enforcement of the Land Acquisition Act, in order to enable the Company to acquire property for what was accepted by Government to be a public purpose. The hydro-electric project, needing sites for the reservoirs and works, involved the destruction of acres of forest, the absorption of miles of waste-land, and the submersion of some thinly populated valleys.

Day by day Mr Tata's position was strengthened. His lucid and enthusiastic presentation of the case had impressed Lord George Hamilton, who transmitted the correspondence to Lord Northcote, the Governor of Bombay. At the same time Sir Richmond Ritchie wrote to Mr Tata: 'As to the second scheme for utilizing the electric power generated in the heights of the Ghats for the purposes of Bombay and its neighbourhood, Lord George can only say that if it is brought to a successful issue it will be an achievement of which you may indeed be proud.'

Fortified by such encouragement, Mr Tata had frequent interviews with Lord Northcote. The results were so satisfactory that the preliminaries of the scheme were soon in order. Activity was needed, for a rival syndicate, the Pioneer, had in hand a somewhat similar project, though the electricity was to be generated by steam-power. Mr Tata, as his elder son has said, 'laboured to establish the principle that the Government and the Municipality should not grant any monopoly for the sale of electrical energy to the Pioneer or any other company that might be formed'. At the same time the syndicate was enlarged, Mr Gostling and Mr Miller each brought in a partner, and Mr Tata ensured the continuity of family interest by the addition to the syndicate of his son, Dorabji, who devoted himself to the work, and eventually carried it to a successful conclusion.

Unfortunately Mr Tata did not live to see the launching of the hydro-electric project, which in his days was planned on a scale far smaller than was at length attained.[1] At the time of his death little had been done, except the preliminary spade work, but the prestige of his name, and the tactful way in which he enlisted the sympathy of the India Office, did much to lighten the labours of those who followed him. The task of developing the scheme and establishing the Company devolved upon his successors.

The elder son, at the age of forty-five, found himself

[1] The original scheme only provided for the generation of 17,000 h.p.

at the head of a great house. He was faced with the responsibility of completing at least three important projects, and of carrying out the wishes of a man who left behind him a number of responsibilities. Mr Tata's death was a severe blow to those who had been with him for many years, and had served him with affection and reverence. The removal of such a great personality broke many personal ties. There was even some hesitation as to whether some of the schemes, which were incomplete, should be continued. His elder son, however, determined not to abate any of the activities of the firm. Had it been a question of considering only himself, he would have declined to shoulder further responsibility, for he had, as he said, already sufficient work. But Mr R. D. Tata interested himself in the financial care of the firm, and Mr Jamsetji's friend and co-worker, Mr Burjorji Padshah, came to the son's assistance, and helped in the flotation of the new concern.

Shortly after Mr Jamsetji's death a syndicate was formed in London, to sift the prospects of the scheme. In 1905 Dr John Mannheim, the electrical expert for Messrs Alfred Dickinson and Co., of London and Birmingham, came to India to investigate the hydro-electrification of Lahore. He heard of the Lonavla project, and was so interested that he visited the Tatas on his arrival in Bombay. A fortnight later he carried away from the old syndicate, which included Mr Gostling and Mr Edward Miller, the option to float the new syndicate incorporated in London, the Bombay Hydro-Electric Syndicate, Limited. They appointed his firm as consulting engineers. At the outset Mr Dickinson did not go to India, but Dr Mannheim paid a second visit to investigate the engineering and commercial possibilities of the project. He was accompanied on his survey by Mr R. B. Joyner, a retired engineer from the Department of Public Works, who had acquired great experience of irrigation problems in the west of India. To the latter belongs the entire credit for the hydraulic section of the work, and the designs for the dams and

ducts as finally constructed. After examining Mr Gostling's proposals, the two experts surveyed the whole of the area, enlarged the plan to its present scale, and made it a commercial proposition.

Their labours were lightened by the work which Mr Gostling had already done, and by the originality of his proposals. He was the first to visualize the possibilities of water-power drawn from artificial reservoirs built on the brink of the Ghats, for until then, hydro-electric energy had only harnessed natural falls. His earlier surveys led to an inspection of the Lonavla and Walwhan areas. He grasped their potentialities, but his knowledge of hydraulics and his electrical training were not equal to the elaboration of the project. Without the later discovery of the Shirawta site, which was indispensable as a reserve in time of drought, the scheme could not have been worked at a profit. The agreements with the purchasers of power involved heavy indemnities if the supply should fail. Had the reserve been provided out of the original storage, the insufficient revenue from the balance would have left the Company without any profit: had there been no reserve and no indemnities, the mill-owners would have been severely crippled. Under Mr Joyner and Mr Dickinson the plans assumed a presentable shape, but their original estimates were greatly exceeded in practice. Experience alone afforded the proper standards. As ultimately designed, the hydro-electric project required far more capital than was anticipated, and it was less profitable. In spite of three years' strenuous work, the London syndicate failed to find sufficient funds. For a time the scheme hung fire, though the ground for working was already mapped out.

The site of the catchment area lies amid a series of valleys which divide the Western Ghats. In their turn three great reservoirs were planned for construction. The first lies at the southern point of the series, close to the hill station of Lonavla, 2,000 feet above the level of the sea. A dam, 3,800 feet in length, conserves the water

THE GREAT MULSHI DAM

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during the rains, and ensures a continuous supply for the generating plant. About 3 miles to the north-east lies the Walwhan Lake, a storage reservoir for the dry season. It is situated between the spurs of the hills, and is hemmed in by a dam 4,500 feet long and 70 feet in height. The lake is about 1,500 acres in area; it is 65 feet deep, and can contain 2,600 million cubic feet of water. At the north-east corner of the group lies the Shirawta Lake, with an area of nearly 5 square miles, capable of containing 7,200 million cubic feet of water. This capacious reservoir necessitated the submersion of a goodly valley, where the water is held in check by a huge pile of masonry, more massive than the famous Assouan barrage. The Shirawta dam is 93 feet in height, 7,670 feet long, and contains upwards of 16 million cubic feet of stone. Thence, at the chosen time, the waters can flow southwards, through a tunnel nearly a mile in length, into the Walwhan Lake, the centre of the series. Some time had to elapse before the chain was fashioned; the Lonavla dam was begun in 1911, the Walwhan dam in 1912, and in 1920 the final link at Shirawta was completed.

From the plateau upon which the reservoirs stand the water passes along aqueducts and through tunnels, built among ravines and water-courses, to the forebay, or receiving reservoir, situated above the reversing station of the G.I.P. Railway. There it enters large pipes, approximately 7 feet in diameter, and rushes along a fall of 1,734 feet to the foot of the Ghats. At Khopoli, 300 feet above the sea-level, a huge volume of water reaches the power-house, developing a pressure of 750 pounds to the square inch.

At the power-station this hydraulic energy is converted into electrical energy. Great Pelton wheels, whirled round by the water, are coupled to electric generators, and electricity is generated at a pressure of 5,000 volts. Again it is raised, through what is known as static transformation, to 100,000 volts. At this enormous pressure the energy is transmitted to the receiving

station at Parel, a distance of 43 miles. Lofty steel towers, supporting half a dozen wires charged with electricity, carry this potent force across land and water to the receiving station in Bombay. Once again the pressure is reduced to 6,600 volts, and transferred to the underground cables which supply the mills. The original scheme was designed to provide 30,000 e.h.p. for 3,600 working hours yearly; the addition of the Shirawta Lake has increased the power provided to 50,000 e.h.p. for the same number of hours yearly.

Early in 1906 the investigations of the experts were concluded. Their report, though tentative, showed that this costly scheme could be made a financial success. One of the largest mill-owners in Bombay, Sir Sassoon David, at once guaranteed to take a substantial portion of the power, a considerable help towards ensuring the stability of the venture. The sons, Dorabji and Ratanji Tata, on behalf of the Syndicate, then applied for a licence to supply electric power to Bombay. A concession for running the tramways and the electric light had already been granted to the Bombay Electric Supply and Tramway Company, who naturally opposed their formidable rivals.

Before the licence was granted the scheme was subjected to a public inquiry. The Chairman of the Chamber of Commerce and the President of the Mill-owners' Association asserted that, as the prosperity of Bombay was dependent upon the cotton industry, the hydro-electric project could not fail to be of distinct benefit to the city. Representative opinion was unanimous in its favour. The Bombay Government, impressed by this favourable reception of the plan, pronounced the scheme as sound, 'inasmuch as it will bring to Bombay a supply of electric power approximately equivalent to 40,000 h.p. at a price lower than coal-generated engine power, and also cheaper than electrical power can be generated in Bombay itself with coal'. They regarded the introduction of electricity as advantageous

in abating the smoke nuisance, and in economizing the consumption of water.

On 7 March 1907, the necessary licence was granted. It extended to the limits of Bombay city, excluding all naval and military quarters. Electric energy was to be generated only by water-power. In view of certain concessions, already granted to the Bombay Tramways, the Tata Company was not permitted to supply any consumer requiring less than 500,000 units a year, but the Tramways Company was precluded from purchasing power from the Tatas and reselling it for lighting purposes to a factory or a mill. As the original estimate did not exceed 30,000 h.p., the Hydro-Electric Company was compelled, under the conditions of the licence, to advertise its terms of supply and to invite applications from mills, factories, and railways. The licensees had also to give the Tramway Company the option of purchasing power, with certain restrictions. Messrs Tata were then permitted to make special flat-rate contracts, for a term of years, with cotton mills and factories requiring a minimum of 1,200,000 units a year, at a rate not exceeding nine pies a unit. Though the Bombay Electric Supply and Tramway Company had the practical monopoly of lighting the city, firms which took their current from the Tata Syndicate were allowed to make special arrangements for their electric lights.[1]

Once the licence was granted, the Syndicate invited the subscription of capital. In order to carry out an engineering scheme planned on such an elaborate scale, it was estimated that Rs2,00,00,000 (upwards of £1,300,000 sterling) was required. A desire for the development of India by its own resources had led Mr Tata's successors to hope that their fellow-countrymen would come forward and finance the enterprise with Indian capital. Owing to depression in the business world, however, the possible investors displayed a languid indifference to this new scheme, and, for a time, the

[1] A summary of the licence, etc., will be found in *Electricity in India*, published by the *Indian Textile Journal* (Bombay, n.d.).

promoters still turned to London for the necessary funds.

As far as the purchase of the current was concerned, Sir Sassoon David had already guaranteed to underwrite a substantial amount. Following this example, Sir Shapurji Broacha, another great mill-owner, soon joined Sir Sassoon in his guarantee. By the end of 1907 the 30,000 h.p. was taken up; at the same time, a substantial amount of the necessary capital was promised by the London Syndicate, who held the licence for two or three years. Unfortunately for the venture, a financial crisis in America deranged the money matters of the whole world. Markets were depressed, and purse-strings were drawn tight. But during the most difficult years the Tata firm kept the Syndicate alive; at one time rejecting unfavourable offers; at another, negotiating with a further group of financiers.

In June 1910, they were on the point of accepting a proposal made to the Syndicate by a London group of promoters, but at this juncture official encouragement for the hydro-electric project came from the Governor of Bombay. Sir George Clarke, better known as Lord Sydenham, was, at one time, an engineer, and, on this account alone, took a keen interest in the development of the Tata project. He supported the firm in their desire that the concern should be financed with Indian capital. The opening of a new cotton mill at Sholapur (2 July 1910) enabled him to deliver an exhortation, which had an instant effect upon his hearers. 'While Indian capital,' said he, 'has now happily been attracted to your mill industry, I have been much struck with the difficulty in obtaining it for other enterprises. There is an excellent hydro-electric project for Bombay, which still awaits initiation. Experience has shown the great value of cheap electricity in connexion with a growing city. The conditions in Bombay are exceptionally favourable, and it was my great hope that the scheme could be launched entirely upon Indian capital. I am informed, however, that this has been found impracticable, and it now seems inevitable that a great part of

the money required will have to be raised in England. There are obvious advantages in carrying out such a scheme as a purely Indian undertaking, and I regret that I see no hopes that this can be arranged.'

The speech sowed the right seed. 'From that point we never looked back,' said Sir Dorabji Tata, a year later, 'we were filled with hope, and our optimism was justified by the launching of the Company in November 1910.' For some years the electric drive had attracted attention in India, and was in use in a few mills in Calcutta, while at Kurla and Nagpur the Tatas ran some part of their machinery by the electricity generated from their own steam-station. It was applied, as a rule, to traction, fans, lights, and refrigerators, but these installations made the uses of the power familiar to the East. The natural caution of the Indian investor gave way to national pride. Sir Dorabji toured India, visiting several native courts, and met with unexpected success in persuading their rulers to subscribe for shares. Patriotism seized princes and people; the prospects of financing the Company with Indian capital were assured. Three months after His Excellency's speech the Directors could proceed to allotment.

On 7 November 1910, the Tata Hydro-Electric Supply Company Limited, was registered as a public concern. The nominal capital was 2,00,00,000 rupees (£1,333,333), divided into 10,000 ordinary and 10,000 preference shares of 1,000 rupees each. Messrs Tata Sons and Company were appointed as agents, with a remuneration of 5 per cent on the net profits, and enough to defray their actual office expenses.

The continuation of his father's work was largely due to the elder son, and on 8 February 1911, Sir Dorabji had the satisfaction of seeing the foundation stone of the Lonavla dam well and truly laid. In his opening speech he gave a short history of the whole scheme, and paid a tribute to those who had helped him to begin this valuable work; the originators of the Syndicate,

the engineers, the officials and others who had lightened his arduous labours. He enumerated the advantages of the project; the high head of water available; the large rainfall; the natural conformation of the valleys; the shortness of the transmission line; the ready market for the power; and the economy in working, which these favourable conditions made possible. Sir Dorabji also expressed his pride and gratification that the enterprise had been financed with Indian capital, and assured his hearers that if further capital were required, it would be forthcoming from the same source.

It was only fitting that on such an occasion tribute should be paid to Mr Jamsetji Tata's pioneer work, and his son, as Chairman, took the opportunity of recalling to his hearers the noble aims which had brought the hydro-electric project into being. 'To my father,' said Sir Dorabji, 'the acquisition of wealth was only a secondary object in life; it was always subordinate to the constant desire in his heart to improve the industrial and intellectual condition of the people of this country; and the various enterprises which he from time to time undertook in his life-time had for their principal object the advancement of India in these important respects. To me it is a matter of the utmost regret that he is not alive today to see the accomplishment of the three cherished aims of the last years of his life—viz., the Research Institute, the Iron and Steel project, and the Hydro-Electric Scheme. . . . Kind fate,' continued Sir Dorabji, 'has, however, permitted me to help in bringing to completion his inestimable legacy of service to the country, and it is a matter of the greatest gratification to his sons to have been permitted to carry to fruition the sacred trust which he committed to their charge.'

After the Chairman's speech, the three hundred guests made their way to the site of the dam, where Lord Sydenham laid the foundation stone. He emphasized the success, which they were gathered there to celebrate, by administering a well-deserved rebuke to

the pessimists, who had not only withheld their capital, but had expressed their doubts as to the soundness of the foundations. 'Only an earthquake could shake this dam,' said His Excellency, 'and fortunately this region is not subject to earthquakes.' He, too, pointed out the advantages of the scheme; the cheapness of the current; the future needs of Bombay, and the diminished pollution of the air of the city, which electricity would bring about. Above all, he took the power scheme as a triumphant vindication of increasing faith in the industrial future of the country. 'It symbolizes,' said he, 'the confidence of Indians in themselves, their willingness to be associated with a project somewhat unfamiliar in this country, and their assurance of the political stability which alone can guarantee the continual advancement of India.'

Later in the afternoon the guests returned to Bombay. All traces of the ceremony were speedily removed, and the plateau was left free for an army of workmen. Upwards of 7,000 hands were employed. Within a few weeks the material for a great engineering scheme was assembled at the proper points. There were pipe-lines from Essen, water-wheels from Switzerland, generators from America, and cables from England. Amid the rocky valleys of the Ghats, where a few stunted trees relieve the rugged scenery, thousands of tons of masonry were hewn and faced for the dams. Ducts and tunnels were built or drilled from lake to lake, and preparations were made for the pipe-line. The foundations for the power-house at Khopoli were laid down. If, at the time, a traveller had walked north-westwards from Khopoli towards the Thana Creek, he would have seen, for over 30 miles of his journey, all the preparations for the great transmission lines destined to bear the current to Bombay. At the Thana and Panvel Creeks he would have found the divers busy preparing foundations, some 50 feet deep, for the bases of towers, nearly 200 feet high, which were to carry the wires to the other side of the water, and thence to the receiving station, without disturbing the navigation of the channels.

By August 1911, the whole of the available power was taken up. Twenty-six textile and two flour mills subscribed for the utilization of 33,000 e.h.p. With the larger mills, taking 600 or more horse-power, and not less than 300,000 Board of Trade units quarterly, contracts were made for ten years at seven pies a unit. The Tata Company installed and maintained the driving plant. Electric light was supplied to the mills, which took their power from the Company, at a cost of one annas three pies a unit.

When, in 1912, the Directors issued their third report, the foundations of the Lonavla dam were completed. Sufficient water to assist the constructional work had been stored. A few miles farther on, the necessary excavation for the Walwhan dam was practically finished. Masonry to the extent of 14,354 hundred cubic feet already filled great trenches, and reached above the level of the ground. A further 200,000 cubic feet of masonry which had been built into the ducts, involved the removal of 4,000,000 cubic feet of soil. About a third of the tunnel between the Walwhan and the Shirawta valleys, 5,127 feet in length, was ready for work. Huge pipes were stacked at Khopoli and Lonavla, some of which were destined to carry the water under the G.I.P. Railway, along tunnels driven through the solid rock.[1] Work on the power-house was well advanced, and, miles away, the concrete bases were ready for the erection of the towers.

By the end of 1913 the Lonavla and Walwhan Lakes were full of water. Both dams were sound. Work on the pipe-line was still backward; the forebay had not made satisfactory progress, but the power-house and receiving-station were ready for work. The transmission towers along the route had been erected and prepared for the lines, while on the high towers across the creeks the workmen had already begun to place the copper

[1] The water at first runs through one set of large pipes. At the junction the volume is subdivided, and down the hill-side it runs into the power-house through pipes of a smaller diameter.

cables. Work went on apace. By 1914 the Lonavla reservoir was ready to supply Bombay, and in the autumn of 1915 the water in the Walwhan Lake had reached its estimated level. The duct between the two lakes was practically ready for service. At the north-east section of the works the tunnel between Walwhan and Shirawta only needed some trimming. Although there was still much to be done, the Shirawta Lake already contained sufficient water to provide for an adequate reserve. Down the valley towards Bombay stood the new power-house fully equipped; its generators, transformers, and switch-gear in full working order. The transmission lines were ready to carry the current, though the insulators were not wholly satisfactory. So forward was the work, however, that the receiving-station could now be opened, and there was sufficient energy available to supply two mills.

The power was switched on with due ceremony. On 11 February 1915, Lord Willingdon, the Governor of Bombay, took the place of his predecessor at a second memorable function. Once again merchants, manufacturers, and officials, both British and Indian, were the guests of the Company. On this occasion the ceremony was held at Parel, the site of the receiving- and distributing-station. To inaugurate the completion of this great enterprise, His Excellency first released the current and then switched on the power to the Simplex Mill. Lady Willingdon put the first machinery in motion. The insignificant buttons which they pressed were the keys of a project which had converted 9 square miles of waste-land into useful lakes, providing sufficient power to drive more than one-third of all the mills in Bombay. The task had been carried out under considerable difficulties, and the knowledge that the hydro-electric scheme was at length at work was as welcome to the promoters of the project as is the safe launching of a gigantic liner to the heads of a ship-yard.

The speeches made at the ceremony were justified in their tone of congratulation. Sir Dorabji, as Chairman,

was liberal in this thanks. He paid a handsome tribute to the successive Governors who had given him every encouragement, and to the ' ungrudging official support ' which had been accorded to the enterprise. Naturally he again expressed his satisfaction that the work had been carried through with Indian capital, by Indian directors, ' an idea,' said he, ' that would have seemed chimerical in my father's day '. Again he referred to Mr Tata's work. ' To my father,' said he, ' the hydro-electric project was not merely a dividend-earning scheme; it was a means to an end . . . the development of the manufacturing power of Bombay. It is in that spirit that we have carried out the fruitful ideas he bequeathed to us, and it is in that spirit that we have received the far-sighted financial support which made possible the construction of the work. As a business proposition pure and simple we could not have asked for, and certainly we should not have received, the financial backing, especially from the progressive Indian states, which has now fructified; the great sums of money needed were forthcoming mainly because those who commanded them believed that the scheme would assuredly play an important part in the industrial renaissance of India.'

Lord Willingdon struck the same chords. ' I wish more particularly to recall to your minds,' said he, ' the memory of that great Bombay citizen, Mr Jamsetji Tata, the pioneer of Indian industrial enterprise, through whose initiation and courage this scheme was first brought into existence.' And then, addressing the sons, His Excellency added: ' It must be a source of pride and satisfaction to you, Mr Chairman, and to your brother, to find that today you have established in India another magnificent and permanent memorial to your father's great services to his country.'

In complimenting the Directors upon the conclusion of an Indian enterprise, Lord Willingdon emphasized a broader view of the project. It was, he said, not only a Svadeshi, but an Imperial enterprise. This was in

accord with Mr Tata's views. Though he had at heart the interest of India, and his first thoughts were for her, it was in no narrow spirit that he worked. He knew that, in industrial matters, the West had much to offer to the East. Though he wanted India to walk alone, he saw that the time was not ripe for her to do so. His period was one of industrial transition, and when Mr Jamsetji branched out into engineering and steel works, he sought assistance across the seas. For the launching of his new projects it was necessary to employ men who possessed the requisite technical knowledge. From 1877 to the present day, from the Ghats to Jamshedpur, from Nagpur to Bangalore, essential workers from the western world have taken a share in those great schemes which are a tribute to Mr Jamsetji's foresight.

As Lord Willingdon pointed out, the hydro-electric project was truly Imperial, the result of co-operation such as the projector desired. Having dealt with a need for joint responsibility, he exhorted his Indian hearers to cultivate a spirit of real ambition for the prosperity of India. 'I cannot do better today,' said he, 'than ask them one and all to take as an example and inspiration for their future lives the life-work of Mr Jamsetji Tata. If they strenuously endeavour to emulate his example, I am full of hope that in the future we may produce many men in this country with brains, character, and courage, whose work will stand high in their various professions in all parts of the world.'

Mr Tata had always acknowledged the pioneer work of Mr Gostling, and his son was equally ready to recognize the debt which the hydro-electric project owed to western workers, particularly on the constructive side. 'In Mr R. B. Joyner,' said Sir Dorabji Tata, 'who has designed and supervised the whole of the hydraulic work . . . work which I believe surpasses anything found elsewhere in this land, where we are used to the taming of rivers and the conservation of waste waters . . . we were fortunate in finding an engineer whose long experience in the service of Government was linked with an

unconquerable energy and imagination, which advancing years could not wither.' Sir Dorabji was equally generous in his praise of Mr Alfred Dickinson. 'Our consulting engineer,' said he, 'Mr Alfred Dickinson, brought to the task not only the great professional skill which has been exercised in many parts of the world, but a robust and unfailing confidence which has been of incalculable assurance to us in the anxious and depressing days through which we have passed.' For not only did Mr Dickinson show great technical skill, but he had studied the financial side of his profession. Another valued assistant, Mr H. P. Gibbs, became General Manager of the Company. He had had entire charge of the Cauvery power scheme, which supplied electric energy to Bangalore and Kolar. After a few years as Chief Electrical Engineer to the Government of Mysore, he superintended the engineering work of the Tata project. He became one of its Directors, and a member of the firm.

The tribute paid to those who had carried out this difficult work was well deserved. At the opening ceremony each visitor received a small pamphlet which explained in simple words the significance of the scene he had just witnessed. 'The scheme comprises four distinct operations,' said the pamphlet, 'the storage of the rainfall on the Ghats; the transfer of the water to the foot of the Ghats; the conversion of this hydraulic energy into electrical energy, and its transmission to Bombay; and the conversion of the electrical energy into mechanical energy at the mills.'

'Stated nakedly,' said the *Times of India*, 'this summary of the conditions conveys a wholly erroneous idea of the character and magnitude of the work. It all seems so easy when reduced to its elements; . . . it is all so infinitely complicated when it has to be carried out in detail.' Already an attempt has been made to show the magnitude and extent of the work, but little has been said of the problems which attended its execution. One or two illustrations may suffice. The duct, which carries the water to the forebay, where it is discharged

into pipes, necessitated the construction of an artificial channel, whereas other engineering schemes have been able to utilize the course of a stream. For 5 miles a river bed of solid masonry was built upon uneven ground; its track hewn out of the hill-side. This artificial river dives under a road-way, and is carried across a railway, until it reaches the pipes. There the engineers hoped to find a firm foundation of rock, but were compelled to line the bed of the forebay with concrete, in order to prevent the absorption of the water. In addition, the actual laying of the huge pipes presented many difficulties. A resting-place for each pipe was hewn in the solid rock with which the hills are faced. When each section of the pipe was hauled into its proper place, and riveted to its neighbour, preparations had to be made to cope with adverse climatic conditions. Excessive expansion, engendered by the tropical heat, necessitated a method of anchoring the pipes, until at the power-house they were steadied by a block of iron and masonry 5,000 tons in weight.

When Sir Dorabji Tata was speaking at the opening ceremony, he explained the difficulties which the Syndicate had overcome. 'We have had,' said he, 'no great perennial river which had simply to be diverted to the turbines, nor region of continuous rainfall which, as in the Highlands of Scotland, permits the storage of a sufficient body of water with small dams. We have, it is true, on the Western Ghats, perhaps the heaviest rainfall in the world, but it falls in ninety days; and the problem was to store the rainfall of three months in such quantity that it would meet our requirements for a year. . . . What that involved is apparent from a few comparisons; the great dam at Shirawta is larger than the Assouan barrage, which, on its completion, was hailed as one of the engineering wonders of the world, and the Walwhan dam is little inferior in size to Sir William Willcocks's great work on the Nile. I have warrant for saying that in no other hydraulic scheme has storage on such a gigantic scale been attempted.

Then, whilst the great fall of 1,734 feet from the forebay to the turbines is one of the distinguishing features of the scheme, because it permits of an exceptional economy of water, it brought great engineering difficulties in its train; we shall ultimately pass through our pipes a quantity of water equal to the flow of the Thames, and by the time they reach the power-house these pipes resist a pressure of 750 pounds to the square inch.'

Power upon so extensive a scale became a distinct advantage to the industries of Bombay. Not only did the textile trade gain considerably by cheap electrical energy, but its extension was facilitated; while the establishment of new industries, both within the city and adjacent to the new lines of transmission, was made an easier matter. From the time a licence was obtained for the hydro-electric project, electrical machinery was imported on a scale unprecedented in the history of Indian trade.[1] Economy in manufacture is the most conspicuous feature of the electric drive. It reduces expense, increases the output, and improves the quality of the production.

A project so beneficial to the city and its industries soon called for expansion. Before the original reservoirs were completed, the Directors resolved to invite further subscriptions of capital. By 1913 they had realized the likelihood of an increased demand for energy. Proposals for the electrification of the local railways were in the air; several other mills were prepared to take their power from the Tata Company, and such an increase of supply could be ensured only by an extension of the works.

In view of this probable expansion, the adjacent valleys were carefully surveyed under the direction of Mr Gibbs, who drew up a report. When assured that, north of Lonavla, a great catchment area was available, Sir Dorabji Tata had little difficulty in obtaining the support of the Governor of Bombay for the further extension of the hydro-electric project. Within a few weeks

[1] *Electricity in India*, op. cit.

permission to acquire the necessary rights was granted to the Hydro-Electric Company. The Government, however, reserved certain valleys for irrigation schemes, which were then under consideration, but the Tata Company was allowed to explore the Andhra, Bhama, and Bhima valleys, with a view to extending the works.

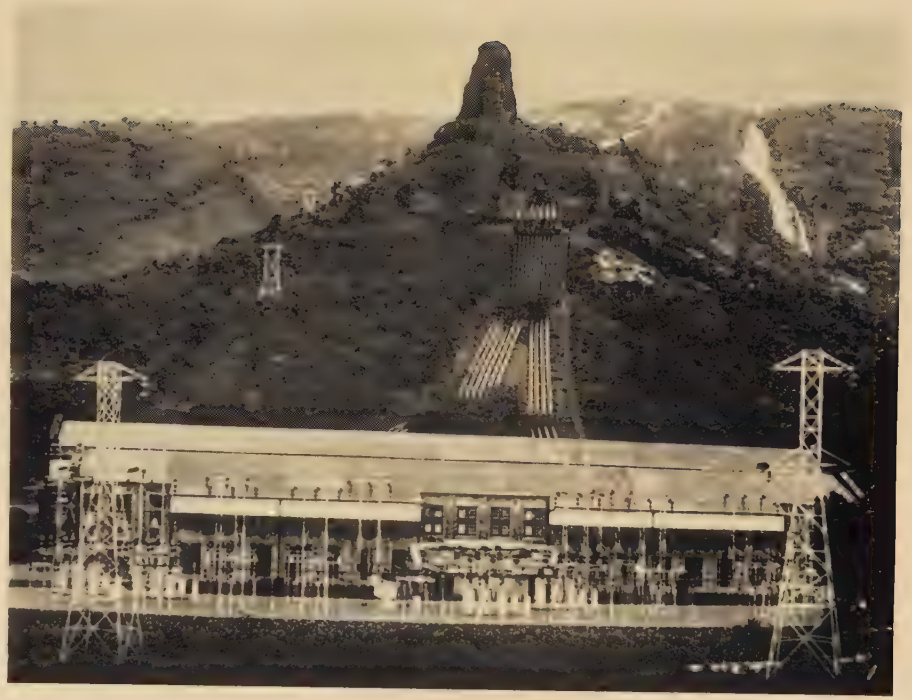
After a further survey, again under the direction of Mr Gibbs, the Andhra valley, some 12 miles north of Lonavla, was adjudged the most suitable for the proposed extension. The valley pierces far into two mountain ranges; at the foot of the hills a small river winds through a deep and rocky channel. At frequent intervals along the course of the stream there are deep ravines which, at the time of the rains, serve as natural feeders from the surrounding heights. At its widest the valley is 8 miles across, but near the site of the dam it narrows down. The catchment area is about 50 square miles, of which 11 miles are now immersed in an artificial lake. It was found that the conformation of the valley required a dam 190 feet high, and a little less than 1,800 feet in length, which could keep back 17,000 million cubic feet of water.

This great successor to the original project is planned to generate 60,000 h.p. It was undertaken in 1916 by an independent Company, the Andhra Valley Power Supply Company, to whom, for a small consideration, the Tata Hydro-Electric Company transferred its second licence for supplying Bombay. The cost of the scheme is about Rs3,50,00,000, and it has already begun to operate commercially. One new feature, which redounds to the credit of its able author, Mr Gibbs, is the elimination of all ducts and channels. Hitherto it was the practice of engineers to drain a lake from near the dam, as being the lowest point. This practice entailed circuitous and lengthy channels, leading the water by means of gravity to a suitable break in the chain of surrounding hills, whence it could be thrown over the Ghats to the power-house through high-pressure pipe-lines. The construction and maintenance of such ducts needed special attention.

Mr Gibbs, however, conceived the idea of raising the dam somewhat higher, so as to accumulate more water than was necessary under the previous system, and then of draining the lake at the farther end by a tunnel, hewn through the solid rock, to the nearest point, where the water could be drawn into the pipe-lines at the edge of the hills. The scheme entailed the making of a tunnel one and a half miles long. The pipe-lines and the generating station at Bhivpuri, 10 miles north of Khopoli, are now completed, the transmission line to Bombay is erected and the electrical energy is now being distributed to consumers.

Owing to the increased demand from Bombay for the electric drive, a further project, that at Nila Mula, has been undertaken by the Tata group of Companies, whose growing experience amply justified such a step. The selected site, discovered by Mr Gibbs, lies about 25 miles west of Poona, where the configuration of the Western Ghats seemed, after close study, to be best adapted to the new scheme. By throwing a dam across the junction of the Nila and Mula Rivers, within three and a half miles from the edge of the Ghats, a lake will be formed, with an area of 16 square miles. The dam, at present under construction, will be 150 feet high and 4,000 feet long; the construction plant is now operated by electric power drawn from the sister Companies. The outlet from the lake will be at Davdi, where an electrically driven tunnel, three and a half miles long, will lead the water to the high-pressure pipe-lines at a point about 1,700 feet above the power-station at Bhira. Thence the power will be conveyed, along three lines of steel trestle towers, to Bombay, a distance of 76 miles. At the present time electrical equipment of 150,000 h.p. is being manufactured for installation, and will be increased eventually to 180,000 h.p.

'If Mr Jamsetji Tata were alive today,' writes one of his friends, 'and could look upon the achievements that have resulted from the first small scheme he visualized at Lonavla, he would have the satisfaction of knowing



THE BHIRA POWER STATION

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how faithfully and earnestly his successors have striven to carry forward logically the great work that his foresight had inspired.' His actual part in the work was small, and merely a minor episode in a life whose story does not depend upon the success of the scheme. But from his death-bed he exhorted those who followed him to preserve the name of Tata, and to pursue and extend his work. His sons and successors have done so, and their story is in part his.

Ample opportunity for Indians who wish to make a career for themselves has been provided by the hydro-electric project. With one exception the Directors are Indian. The brunt of the organization fell upon men like Sir Dorabji Tata and his cousin, Mr R. D. Tata, Mr Padshah, and Mr Bilimoria. They had already won their spurs under Jamsetji Tata's guidance, and they in their turn have gathered round them a band of young Indians, who have carried on the traditions and have preserved that veneration for the founder which makes them feel like members of a single family. The name of the registered office, Navsari Buildings, was in itself an inspiration to those who are ambitious, for it served to remind them of the birth-place of the man who conceived so great an Indian enterprise; a man who, coming from a remote and insignificant town, left his mark on a great city.

CHAPTER XII

SOCIAL LIFE

HAD Mr Jamsetji Tata lived in Europe or America his name would have been more familiar to the public. In England his philanthropic schemes would have brought him temporal honours, but he remained one of those commoners who give a singular dignity to the simple prefix which is the right of every male citizen within the Empire. There was, at one time, a suggestion that some title might come his way. Certain of his contemporaries, by giving largely to charity, and by creating a trust, had obtained recognition, but those who thought that Mr Tata was prepared to purchase a conditional honour by way of the Institute of Science merely roused the old man's scorn and indignation. No title, indeed, could have enhanced his position, but the knighthoods bestowed upon his two sons were a posthumous compliment to himself, and an assurance that the prestige of the family was maintained by his heirs. He died, as he lived, a citizen of Bombay, his only suffix that of Justice of the Peace, and, in later life, a Fellow of the University.[1]

Yet, in an unobtrusive manner, he played a considerable part in the life of the city to whose amenities he contributed his full share. 'He had a great love for beautiful Bombay,' says one of his English friends, 'and a great pride in its progress, and he took pleasure in driving me over the new quarter he was building, filled with residential houses for the accommodation of Europeans turned off Malabar Hill by the height of competitive rents. His new hotel also was a great satisfaction to him, for he intended it to be one of the best according to the highest European standard.' As

[1] The Japanese Government, however, gave him an Order.

he drove through the town, or walked from Esplanade House to Victoria Buildings, Mr Tata, with his kindly face and snow-white beard, was a familiar and picturesque figure. As a rule, he wore a simple white costume and, on his head, the Parsee turban, or the small skull-cap, which orthodoxy forbade him to lay aside. To those who saw him in the streets, the only sign of wealth displayed was in the perfect appointment of his carriage, for he took great pride in his horses and their equipment.

At sixty years of age he was one of the most prominent men in India, and had shown to the world the stuff of which he was made. By sheer force of character he had converted his modest capital into considerable wealth, and could be reckoned among the richer Indians of his day. He possessed all the qualities which make for success; he was honest, cautious, and resolute, and could bring courage and imagination to bear upon his schemes. His varied interests may tend to obscure the real stature of the man, but a master mind moved behind these apparent diversions, and his greater achievements were representative of India's rapid advance in industry. He was, however, so far ahead of his times, that his countrymen could not always keep pace with his broader ideas nor comprehend their drift. 'There was,' says Mr Lovat Fraser, 'hardly any other man among its millions who may more fitly be said to have united within himself the qualities of which the Indian people stand so greatly in need.' Mr Tata began his career in a practical way, until he took, at length, a leading position in the cotton trade. When he attained this coign of vantage he turned his imagination and his organizing powers to fostering spacious schemes for the educational and industrial development of his country. Though he reaped rewards, he never became a mere money-maker, but stood before his fellows as a truly noble man, who commanded the respect and esteem of everyone with whom he came into contact.

So successful had been his career that it is well to recall

the difficulties which he had overcome. At the outset of his business life he and his father were involved in Mr Premchand Roychand's failure, and were compelled to sell their house and property in order to discharge their debts. The Empress Mills involved much hard work and anxiety; the Svadeshi Mills at first swallowed part of their founder's hard-earned fortune, and forced him to greater exertion at a time when his state of health was such that a well-earned rest might have prolonged his life. These difficulties only served to develop his character, and to exhibit his determination, his energy, and his integrity.

Success had not, however, hardened his heart. Business played its duly proportioned part in his life, but did not stifle his generous feelings. To the last, while somewhat reticent, he remained sensitive, sympathetic, and sincere. His friend, Sir Dinshaw Wacha, recalls that, in the years of endeavour, Mr Tata's delicate nature was frequently wounded by the pinpricks of diurnal worries. By degrees he learned to ignore these minor troubles, and recked little of himself. His fount of sympathy grew deeper. Another friend, Sir Lawrence Jenkins, Chief Justice of Bombay, once told an audience that when speaking of the hardships of the poor, Mr Tata's eyes were filled with tears. 'I have spoken of Mr Tata's sympathy,' said Sir Lawrence, 'and in this I use no empty phrase; for it was with him a living force.'[1] 'His interest in the poor was always showing itself,' says Mr O'Conor. The two men were discussing cotton seed, which in those days was left to waste, instead of being converted into a by-product. Mr Tata expressed concurrence with the commercial possibilities of using it for oil, but added: 'If we buy up the seed, what will the poor people do for their cattle food?' Even over a matter which touched him so nearly as the excise duties on cotton, he was ready to consider the case of the millions of hand-loom weavers, who were not subject to taxation on the cloth they wove. He admitted their competition, but said that

[1] Sir D. E. Wacha, *Life of J. N. Tata.*

he would never take any steps to extend the excise duties to them. 'Let the poor devils have the advantage,' said he, 'I don't mind.'[1]

His sympathy with the deserving poor made of him a liberal subscriber to all recognized causes, irrespective of race, politics, or creed. When the Salvation Army needed assistance, they came to Mr Tata and received both material aid and moral support. He was always prepared to spend money for the public good. One of his greater efforts for the welfare of the community was his attempt to arrest the bubonic plague. He did, indeed, all that a private citizen could do to combat this misfortune. For three consecutive years (1896–9) Bombay was visited by this terrible scourge. In 1898 the death-roll of the city exceeded 18,000, and of those attacked by the disease no less than 91 per cent succumbed. In the previous year a young Russian doctor, Professor Haffkine, had introduced his system of inoculation, but concealment and mistrust had rendered its effects inoperative. Stories were spread abroad of cases in which leprosy and small-pox had been propagated by the serum. Many doctors, both English and Indian, were jealous of Haffkine. Mr Tata, however, who at once recognized the value of the new cure, became one of the Professor's warmest supporters. He was inoculated more than once, and was always prepared, if necessary, to submit to a further dose. He studied every book and every pamphlet which he could acquire, bearing upon the various plagues. He insisted that all his servants should be inoculated, and set on foot an exhaustive inquiry as to the effects of inoculation among his fellow-Parsees. He spread the gospel of inoculation among his friends. Ten days before Sir Dorabji Tata's marriage, Mr Bhabha, the father of the bride, arrived in Bombay. He called upon Mr Jamsetji in the early morning, and found the doctor busy with the staff of Esplanade House. Mr Tata insisted that Mr Bhabha should be inoculated, then and there, before all the rest. His friend did his

[1] Mr J. E. O'Conor to Mr Lovat Fraser. Cf. p. 161 *ante*.

best to evade such a welcome, but the host appealed to him as an educated man, whose business it was to set an example to others.

Jamsetji Tata's social life was spent mainly at the Elphinstone Club, where he often entertained some well-known traveller to talk over the world's affairs, and at the Sunday dinner he chatted about the doings of the community with his fellow-Parsees. Though deeply attached to his favourite haunts, he was ready to give a portion of his time to the social interests of younger men. A firm believer in the benefit of athletics, he took a prominent part in the establishment of the Parsee Gymkhana. He frequently attended the committee meetings, and to the end of his life was by far the largest contributor to its funds, though it was his elder son who had to ask him for the money. Dorabji Tata was the moving spirit of the new institution. At Cambridge he had played cricket and football for Caius, and to one so keen on sport the voluntary work was a real pleasure. For ten years the younger man devoted all his spare time to the welfare of the Gymkhana, acting as honorary secretary, and captain of the cricket eleven.

Club life has always made a special appeal to the Tata family: Mr Nusserwanji set the example as the central figure of his small coterie; Mr Jamsetji was an original member of the Excelsior, the Elphinstone, the Ripon, and the Parsee Gymkhana; while Sir Dorabji aided his father in founding the two last-named. Later, again, the son took a prominent part in establishing the Orient Club, a cosmopolitan body, of which he was one of the first two honorary secretaries. Within recent years he was made a founder member of the Willingdon Club, named after the Governor of Bombay, and he sat on the executive committee. It is a club where Indian and European can meet on the common ground of sport. By these associations Sir Dorabji continued, to the third generation, that interest in social life which his father and grandfather were always ready to share with

their fellow-citizens. He is also a member of the M.C.C., and Sir Ratanji was a member of the Carlton.

The first three clubs with which Mr Jamsetji was associated were non-political, but in 1883, when the National Congress was in its infancy, he and his friend, Pherozeshah Mehta, conceived the idea of a political club, named after the Viceroy, Lord Ripon, whose programme of reform had aroused a desire for freedom, which was at once opposed by all the forces of reaction. The introduction of a Bill, drafted by Courtenay Ilbert, for the trial of Anglo-Indians by Indian magistrates, had been received with enthusiasm by the educated Indian, and with execration by those Englishmen who looked askance at every reform. When the retiring Viceroy passed the Bombay Club in state, neither flag nor decoration was displayed. To Mr Jamsetji this petty action appeared a mistake upon the part of the members: he saw that it would encourage others to discriminate between the various Viceroys, and would teach the Indian to treat with disrespect any representative of the Crown who was adjudged unpopular. Sir Pherozeshah endeavoured to arouse public opinion on behalf of the Ilbert Bill, and Jamsetji Tata was, in his reticent way, an ardent supporter of this Liberal measure. The two friends met at least once a week to chat over family affairs or discuss political matters, and they decided to found an institution where, amid pleasant surroundings, the political education of its members could be moulded and organized. Both of them were men of middle age, whose strenuous lives demanded more time than they had at their disposal for the necessary canvassing of those who desired to join them. Fortunately, Sir Dorabji Tata, who was then on the *Bombay Gazette*, found some spare time on his hands, and came forward to the assistance of his elders. He volunteered to approach a number of young professional men and Government servants, rapidly enrolling a small band, to whom he furnished lists of probable members. Within a brief space of time the signatures of close on 200 candidates

had been secured. With the addition of those already enrolled by the founders, it was decided that a sufficient number had been obtained to warrant a commencement. In 1883 the Ripon opened its doors, and the new Club, with its political meetings and banquets, immediately took a distinctive place among the Parsee institutions in Bombay.[1]

Speeches and banquets had little fascination for Mr Tata. For one so interested in politics, he exercised the greatest self-restraint in putting forward his views to the public, but no gathering was considered to be really representative unless he gave it his support. He never addressed a political meeting, though once or twice he consented to second a resolution, but a few words were made to suffice his audience. In the biography of Sir Pherozeshah Mehta, who played a leading part in the initiation of the National Congress, Mr Tata's name occurs but twice, and then not in that connexion; yet in after years, at the unveiling of the Tata memorial, his friend pointed out that from the first Mr Jamsetji supported the Congress, and remained a member of that body to the end of his life.

He gave freely both of his time and money to the Bombay Presidency Association, which provided the local machinery for Congress. 'The current notion,' said Sir Pherozeshah, 'that Mr Tata took no part in public life, and did not help and assist in political movements, was a great mistake. There was no man who held stronger notions on political matters, and though he could never be induced to appear and speak on a public platform, the help, the advice, and the co-operation which he gave to political movements never ceased except with his life. And the proof of this statement lay in the fact that Mr Tata was one of the foundation members of what might be called the leading political association in the Presidency—the Bombay Presidency Association.'

There are many men who take a profound interest

[1] H. P. Mody, *Life of Sir P. M. Mehta*, i., 251.

in politics, but leave the dust of the arena to those who desire applause. Such a man was Jamsetji Tata. 'It is by solid work such as your father did,' wrote one who knew his worth, 'that India will be brought up to a higher standard of comfort and civilization, and as that higher standard develops so will the capacity for self-restraint and self-government increase. I therefore look upon your father and the group of men who are following in his footsteps, not merely from the commercial standpoint, but as political pioneers of the most reliable character.'[1] But Mr Tata held strong views, and when, on one occasion, a friend thoughtlessly said to him, 'You can have no concern with the Congress; you are not a native of India,' Mr Tata replied sharply, 'If I am not a native of India, what am I?' For he was an Indian first, and a Parsee afterwards. He was in the fullest sympathy with the aims of Congress, as he knew it, when it was working for self-government by constitutional means. In 1883, he was present at its birth. During the first years of its existence, the annual meetings were not marked by those stormy scenes which began in the twentieth century.

Though a warm supporter of Congress, Mr Tata preferred not to take an active part in its affairs. He had neither the time nor the inclination for political strife, but on one occasion he assisted in threshing out an economic question which aroused the fiercest controversy. Bimetallism, the use of both gold and silver as legal tender, was discussed by every man who took an interest in the financial affairs of the world, while in America a presidential election was fought on this issue. For many years it had affected the exchange. India, with her bimetallic standard, suffered from continual fluctuations in the value of the rupee, due to the ever-changing relations of the 'gold price of silver'. In 1893 the Indian mints put an end to the free coinage of silver, and the Government endeavoured to stabilize the value of the currency.

[1] Lord George Hamilton to Sir Dorabji Tata, 25 June 1920.

In 1894 Mr Tata plunged headlong into this bygone controversy, by writing a lengthy letter to the *Statist*.[1] He was seriously alarmed at the inevitable increase of India's indebtedness to her foreign creditors, which was in the nature of a clear loss to his country, and, as he deemed, to the Empire. Cotton, the only important Indian manufacture, would be, said Mr Tata, 'most seriously crippled'. The new legislation gave to the Japanese merchant a great advantage over his British rival, an advantage which the Japanese were shrewd enough to exploit. Again, he watched with some anxiety the growing rivalry with the Far East. 'An impetus,' said he, 'will be given to the cotton-spinning industry in Japan. Her competition has already robbed India of the Japanese yarn trade. It may now cut us off from our best customers, the Chinese.'

In addition to hampering the foreign trade of India, it appeared to Mr Tata that the new legislation—'this rash experiment', as he called it—laid additional burdens upon the agricultural class. 'The Government's measures,' he wrote, 'have really imposed an additional tax upon the poor rayat, whom everybody admitted to be overtaxed already. . . . If it be argued that although his produce brings him fewer rupees, each rupee is of enhanced value, the answer is that he has to pay his land tax in the enhanced coin.' More than 70 per cent of the peasants were in the hands of the money-lender, and a stroke of the pen had increased their liability to their creditors by 12½ per cent. 'Even by the depreciation of silver,' wrote Mr Tata, 'the rayat is the chief sufferer. Although he is nearly always in debt, his womenkind have a few rupees' worth of silver ornaments on their persons—a reserve of property to be used as pledges during hard times or family misfortunes—when even the village money-lender may fail him.' The measure, to Mr Tata's mind, was one which made the rich richer, and the poor poorer: 'it gives with an open hand to those who already have

[1] The *Statist*, 3 March 1894.

in plenty, and takes away from those who have scarcely anything left to give.'

One of the chief criticisms which Mr Tata passed on the Government's action was that upon the 'exchange compensation allowance'. The depreciation of the rupee on the London Market had been received with dismay by the Civil servant, paid in rupees, who transmitted to England a portion of his salary for the benefit of his dependants. His grievance was speedily obliterated by the Government, an action which, in Mr Tata's view, was a 'wholesale and permanent increase of official salaries'. Those who had agreed to receive payment in the Indian currency, and not in pounds sterling, were admittedly at a disadvantage. 'It is not denied,' said he, 'that the officials have a moral claim to indulgent consideration, and no objection would have been taken to a discriminating scheme of compensation after due inquiries.'

Mr Tata's letter aroused immediate controversy in the Press. The *Times of India* quickly took up the cudgels on behalf of the Civil Service, and, in so doing, accused Mr Tata of depreciating its merits.[1] He at once replied: 'I am behind no man in appreciating to the full the splendid services its members have, from time to time, done to this country. But one need not, therefore, be blind to its defects, nor rest satisfied with the blissful impression that it is the best of all blessings attainable under the sun.'

These were apparently his last published words arising out of this intricate matter. He devoted much study to the question, for he feared that a trade in spurious coins might spring up in India. The discussion of bimetallism always tended to pass to political controversy, as it did in this instance, and it was the economic side which appealed to Mr Tata. But the discussion gave him an opportunity for touching upon two points in which he was interested. The first was his suggestion for a graduated income-tax. 'I should

[1] *Times of India*, 10 April 1894.

not hesitate,' he said, 'to recommend even 20 per cent on incomes over 50,000 rupees a year.'[1] The second was his reference to the excise duties on cotton, and his answer to the Government view that the average dividends of the Indian cotton mills were 15 per cent, whereas, in his opinion, they never exceeded 7 per cent, and were frequently less than half that amount.[2]

While the controversy over bimetallism flared up and flickered down, Mr Tata followed it carefully. His numerous news-cuttings, which form an admirable index to his interests, were full of the matter. He was, at the time, busily engaged in other affairs, such as his endowment fund for scholars, the establishment of the Tata line of steamships, and the spinning of finer counts at the Svadeshi Mills. His interest in the controversy died away as bimetallism ceased to be a burning question. In 1899, when Australia and South Africa were sending out increased supplies of gold, India accepted the monometallic standard, and came into line with the chief countries of Europe.

Any measure which tended to disturb India's economic stability would soon call forth a protest from Mr Jamsetji. He had an excellent head for figures, and was a sound authority upon currency problems, or the fluctuations of the exchange, and the manipulation of the bank-rate. Apart from such subjects, which appealed to his love for statistics, he devoted his political and social work to the general welfare of the Indian people. In later life, under the influence of Dr Row, he took a keen interest in the furtherance of medical science. To the Salvation Army he gave substantial help towards their work for the reformation and reinstatement of prisoners, especially of women, whom they rescued from a life of degradation, and put to work at various trades. Mr Tata's unseen charities were numerous, for he was always touched by the woes of the downtrodden, whose lot he desired to improve by the eradication of social

[1] *Bombay Gazette*, 1894.

[2] See Chapter III, p. 57 *et seq.*

evils. One reform, which he had especially at heart, was that of the liquor traffic. He hated drink, and a chance incident exhibits his unbending attitude towards it. On one occasion, during a sudden attack of illness, he said to the physician, who was called in: 'Doctor, let me have a little brandy; I think it would do me good.' The doctor, a stranger, dissented, though Mr Jamsetji affirmed that at his first seizure brandy had revived him. 'What did the fool mean?' he asked afterwards. 'Does he think I like drink? I hate it like poison. I would like to throw it all into the sea.' For Mr Jamsetji always advocated temperance. 'In private circles,' says Sir Dinshaw Wacha, 'Mr Tata never missed condemning the vice of drink whenever occasion offered.' That the right to sell intoxicants should be knocked down to the highest bidder, seemed to him a curse. He was even prepared to act as the licensee of an extensive area, guaranteeing to the revenue the average profits for the previous decade, provided that the surplus should be spent upon educational reform.

To education he looked for the moral and material regeneration of India, and did everything to encourage its advance in all directions. His faith in India's future was coupled with a desire for her political progress. He had great ideals of the scope and duties of government, of whose short-comings he was by no means a silent critic. Steeped as he was in philosophic Radicalism, Mr Jamsetji welcomed every reform, and he would seethe with indignation at what he deemed an injustice. He condemned the sycophants who concealed those grievances which galled his countrymen, but he had little sympathy with malcontents who had no practical policy to put forward for the betterment of the country. He was, himself, a practical reformer, sociologist and philanthropist. 'He never made himself prominent as a politician,' says Mr O'Conor, 'leaving public affairs and speech-making to others; but he held strong views, and was intensely patriotic.'

Fortunately, among the few papers which Mr Tata

preserved, there lies the draft of a letter written at his suggestion by Mr Padshah. For three generations, up to the present day, the Birdwood and the Tata families have preserved a close friendship, and this communication was addressed to Mr Jamsetji's friend, Sir George Birdwood. Though, on second thoughts, it may never have been sent, it remains as some evidence of Mr Tata's political views. He did not turn a blind eye to the defects and difficulties of British rule, but he was free from any bias against British culture. Many of his strongest friendships were with officials, especially those with Liberal leanings. The opening indicates that this may be a portion of a longer letter, but the care with which it is drafted shows that Mr Tata did not wish to be misunderstood.

'As for my antipathy to everything English,' he wrote, 'it will reassure you to know that it is a myth. The Parsee . . . becomes anxious when the interests of British supremacy are sacrificed to indulge individual arrogance, or to gratify service clamour, or to perpetrate a new caste domination. That these unfortunate perversions exist, you ought to know even more than I; it cannot be accidental that men like Lords Ripon and Reay, beloved of the natives, were odious to Englishmen. The cases may be rare, but not so rare as to pass unnoticed. In so far as they are noticed, they wound to the heart races as sensitive as they are mild. What should be the duty of a friend of British rule whose vital interests are jeopardized with that rule in danger? Should he harp with tiresome reiteration on the contrast between the past and the present, on the blessings of peace and justice and general state benevolence that have followed centuries of rapine and anarchy and state indifference? He would thus deeply offend the universal sense of justice, hurt the victims of official misconduct, and perhaps give a false sense of impunity to the wrong-doers. That would multiply wrong-doing, and hasten its Nemesis. And then? No, my dear Birdwood, it should be well for Englishmen, even Englishmen in

India, to feel that as long as there are two sides to a question, it is using the giant's strength like a giant to put the foot down in every case; that the friends of British rule may sometimes take a side not in favour with the Powers-that-be; and that it is the presence of this criticism that is the only guarantee for right behaviour in young men suddenly placed in positions of power. You call yourself a friend of the Congress, so is Sir William Hunter, so was Sir Richard Garth—all three Conservatives. That in itself shows that the Congress *has* a favourable side. To read the Anglo-Indian organs, to hear English officials, merchants, and brokers, the Congress is ridiculous when it is not mischievous. Will it help the permanence of British rule, if the native, his habits, his ideas, his ancestry, his religion, his hankerings for the past, his aspirations for the future are all equally and perpetually set down as matters to excite derision? Would you wish me to proclaim that the Englishman, like the king of old, can do no wrong? Much of native criticism of officialism is captious, many of the notions advocated by political leaders are possibly wrong. But, that official advancement should be more assured by renouncing and denouncing the Congress and all its works, cannot be just, cannot be countenanced. I say no more. I do not think Englishmen with whom I have had the privilege of talking think I am worse than a critic in their own camp, over-anxious about their good name. And if I recommend foreign lines of steamers, is it understood that that is a matter of business; a matter of cheaper fares, more agreeable food, more courteous attendance, and less haughty fellow-passengers? Am I wrong?'

Mr Tata's elder son, in putting aside the draft, endorsed it with a note that he recollects a temporary coolness between his father and Sir George Birdwood, who was, for a time, somewhat distant in his relations with his Indian friend. Internal evidence points to a difference of opinion upon the aims and methods of Congress, and to a disagreement between the two men

over Mr Tata's preference for travel by foreign lines.[1] Whatever the occasion which caused Mr Tata to take up his pen, the letter stands as a fragmentary exposition of his political creed. Since his death, India has changed. Her voice is uplifted with greater insistence; she is more united. Though Mr Tata frequently alludes to the Parsee attitude to British rule, he speaks on the whole not only for his own community, but for every true-born Indian. As usual, he reaffirms his loyalty to the British connexion. From time to time he was apt, in industrial matters, to extol America or Germany, or Japan, for he forgot that England was like an old-established firm, content to rest upon the laurels already gained. It was said of him that 'he united the daring courage of the American captain of industry with the German passion for details; and it is probable that he caught, during his many visits to that country, something of the spirit which has made modern Japan great among the powers'.[2] When it came to politics, however, Mr Tata was so firm a believer in the right trend of British rule, that he always wished for power to defend the representatives of England, being, as he said, 'over-anxious about their good name'.

Political, social, or legal discrimination between the Englishman and the Indian[1] were to him particularly distasteful, and he felt it still more keenly when discrimination was extended to business matters. On one occasion he was asked, by a Lancashire textile manufacturer, to pay £117 for some carding-machines of a pattern which he knew was supplied to English houses at £85. Naturally Mr Tata protested against this overcharge. He found his opponent 'firm and obstinate', but a threat to withdraw the order brought about a reduction of over £10 a card. 'One thing very much put me up against his machinery,' wrote Mr Tata, 'and that was when I asked him whether he would

[1] Mr Tata avoided travelling by the P. and O. Line, because he noticed a certain amount of discrimination as between the European and the Indian.

[2] *Times of India*, 20 May 1904.

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promise to place us on the same terms, as regards the price of his cards, with the latest orders he had filled in Lancashire; he answered me bluntly that he must, as an Englishman, decidedly favour Lancashire in his prices compared with the prices he received from his Indian customers.' After assuring the manufacturer that his prices were public property, Mr Tata met the man with equal firmness and obstinacy. 'I as positively told him,' he wrote, 'that unless I was placed on exactly the same footing as his other customers in Lancashire I would never more buy an engine of his, and try to persuade my fellow-manufacturers in India to do the same.'[1]

While a well-reasoned loyalty to British rule was part of Mr Tata's political faith, he wished England to point the way to freedom, and to carry out the finest traditions of the Liberal creed. His political views were those of the more advanced Liberals in England. In his earlier days he particularly admired John Bright; later in life he had an equal admiration for Gladstone, with whom he once, to his great pleasure, conversed in a train, and he was in full sympathy with the man who was then known as John Morley.[2] Any deviation from the purest Liberalism was to him abhorrent. He kept voluminous cuttings from various papers, relating, as a rule, to matters of trade or finance, but here and there among these volumes are scattered a few extracts which throw the light for a moment upon his political interests. Jealous as he was of Great Britain's honour, Mr Tata felt deeply any action which stained the good name of the Empire. A series relates to long-forgotten incidents, prominent at the time: the death of a syce at the hands of his master; the violation of two Indian girls by British soldiers; the punitive police which were planted in Poona after the murder of two Englishmen; and the reports of misconduct by those who carried out regulations to stem the plague. It was obvious that he was deeply stirred

[1] Mr Tata to Mr Bezonji Dadabhai Mehta, 1 June 1900.

[2] The late Viscount Morley of Blackburn.

by the Jameson Raid, and by the subsequent attempts to exonerate Joseph Chamberlain and Cecil Rhodes. The *Review of Reviews*, under the able editorship of W. T. Stead, was then at its zenith. It skimmed, for thousands of readers, the cream of the Press, and reproduced the scathing cartoons in which Carruthers Gould pilloried the Tories. Mr Tata preserved all these extracts, and with them he kept the parliamentary debates upon the raid.

The absence of other extracts is sufficient indication of Mr Tata's political views. Though his participation in politics was confined to regular attendance at the Congress, he was deeply interested in the trend of affairs at home and abroad. He was one of the first to recognize the advent of Japan as a great Power, and in his dying days he prophesied her victory over Russia. During the 'war of freights' he foreshadowed the possibility of a contest between England and the Central Powers; as early as 1885 he predicted Mr Chamberlain's adoption of protection, and, as to Indian affairs, he for long asserted that Professor Gokhale would become the leader of a national movement. Before the term 'Svadeshi' became a political cry, Mr Tata had adopted the name for one of his mills. In a sense he wanted 'India for the Indians', but his patriotism was, as one of his friends has rightly said, a form of patriotism which was in the best interests of India and of the English connexion.

He had many English friends, to whom, as well as to Indians, he extended the hospitality for which Esplanade House was always available. A well-known traveller, Mr Ascott Hope, writing his impressions of India, was particularly pleased with his reception. Mr Tata met him as they were travelling to Bombay, invited him to stay at his house, and committed him to the care of his son, Dorabji. 'I wish,' said Mr Hope, 'I had space to enlarge on my own treatment by a Parsee gentleman, whose sumptuous mansion, said to be the finest private residence in India, did not so much impress me as his singularly courteous and considerate hospitality

to one, almost a stranger. This gentleman would be welcomed in any society in England; his eldest son a Cambridge man, his friends the leading citizens of Bombay.'[1] Jamsetji Tata, as a rule, kept open house. He was always prepared to lend his place for a reception, and would foot the bill, though his name rarely appeared upon the invitations. He preferred to leave the entertaining to his sons. His hospitality was as catholic as his charities. Before Bishop Macarthur left Bombay he was entertained at Esplanade House, and the leading residents were invited to meet him.[2] On the departure of Professor Wordsworth a similar function took place. When Sir William Ramsay visited India to report upon the Institute of Science, he found as he said, that Mr Tata had brought hospitality to a fine art. He was afforded opportunity to see everything, under the most pleasant conditions. On arriving in Bombay he and his wife were taken in hand by Mr Padshah, whom he describes as 'theosophist, vegetarian, altruistic, and an Admirable Crichton after the Indian model'. Mr Tata found for him a Goanese travelling servant, a 'most devoted retainer', says Ramsay. During a delightful excursion to the caves of Elephanta, the Professor and his host discussed the Institute of Science, for it was occasionally Mr Tata's custom to broach important matters while driving or boating with his friends. On their return journey the Ramsays stayed with Sir Dorabji and Lady Tata at their house on Malabar Hill. So delighted was the great scientist with his reception in India that he wished to return to the East: 'the glowing memories and the friendships formed and consolidated there,' says his biographer, 'coloured all his after-life.'[3]

Though Mr Tata by no means confined his hospitality to his own community, he extended it freely to his fellow-Parsees. While in London in 1900, he gave a

[1] Ascott R. Hope in the *Daily Graphic*, 18 May 1891.

[2] *The Record*, 13 November 1903.

[3] Sir W. A. Tilden, *Life of Sir W. Ramsay*, pp. 242-56 (London, 1918).

dinner to some seventy of his co-religionists at a well-known restaurant. Two years later, on his return from Düsseldorf, he entertained a still greater number at Kingston-on-Thames. It was the largest gathering of Parsees which had hitherto been held west of the Suez Canal. To make it a success Mr Tata spared no expense. He wished his guests to see the beauties of the river, and chartered a pleasure-steamer from Westminster to Kingston. He played the host to perfection, though he deprecated, in courtly manner, the numerous expressions of thanks. His friends, Sir Jamsetji and Lady Jeejeebhoy, had cut short a tour of Scotland in order to be present; Sir Muncherji Bhownagree represented the House of Commons; Mr Dadabhai Naoroji, the doyen of the Parsees resident in England, brought his family. Mr R. D. Tata brought his French bride, who within a year, was invested in Bombay with the sacred thread and *sudra* of the Parsee religion. At Kingston, dinner was preceded by the prayers and blessings of the Avesta. It was the Parsee New Year. Sir George Birdwood began the formal speeches, and Mr Tata then welcomed his guests in a few modest words, expressing a wish that a similar celebration should be held regularly in the future. Before the party broke up, the host was assured of the affection and esteem with which he was regarded by his own community, but he could not help discounting the elaboration of the speeches by his fear that they ' savoured of flattery '.

There was, however, matter in one of the speeches which was more intimate in its significance. In referring to Mr ' R. D.'s ' marriage, Sir Muncherji Bhownagree, who proposed the chief toast, concluded by saying: ' I may recall as an example of the enlightened sentiments of our host, that recently an event has happened in his family which, I am told, would have been impossible without his sanction and consent. I have the great good fortune to have on my right hand a lady of French nationality who is associated in life and fortune for the rest of her days with Mr Tata. If I am rightly informed,

Mr Ratanji Tata, the lucky possessor of that bride, had some misgivings as to how the projected union would be regarded by the head of his family. The fact that, in spite of his many years of life and of what may be regarded as his orthodoxy, Mr Jamsetji Tata gave his ready consent to the alliance is one more proof of his progressive tendencies and his interest in the social advancement of the community.'[1]

This gathering proved to be the last of the kind which Mr Tata attended. When he came to Europe, less than two years later, he came there only to die. Though his health was already failing, he still took the keenest interest in his affairs. Within a month of his death he was looking forward to a similar party for the following New Year, when he hoped to entertain at least a hundred Parsees in London. Even then he had not realized that the end was near.

[1] See *Times of India*, 6 October 1902.

CHAPTER XIII

FAMILY LIFE

FROM the year 1887 Esplanade House became the centre of Mr Jamsetji's family life. Mrs Tata was a quiet and orthodox Parsee lady, charitable to the poor, and generous to her own kith and kin, but she had little share in her husband's interests. For many years a younger sister lived under Jamsetji Tata's roof, and about 1898 a second sister, Mrs Saklatvala, joined the family. Cousins and nephews came and went, but the usual circle was quite small. Mr Jamsetji's birthdays were celebrated with an ever increasing number of guests, and the weddings of his two sons were made occasions for the generous hospitality in which the host took a keen delight. The younger son, Ratanji, married, in 1892, a Parsee bride, Miss Naja Seth, and the two resided with Mr Tata until his death. Six years later, the elder son, who married Miss Meherbai Bhabha, set up house on Malabar Hill. But, when in Bombay, father and sons saw each other daily, and Esplanade House was always open to the family. Now and again, at the eleven o'clock breakfast, some cousin, or nephew, or remoter relative, perhaps from Navsari, joined the circle, and the head of the house displayed the keenest interest in all the family news which he could then gather. To all he was hospitable, and full of kindly inquiries as to the welfare of every branch of his kindred.

For Mr Tata was the central figure of three generations, all of whom looked to him for assistance or advice. His father was a partner and a friend; his sons were to him the same. The whole family regarded him with veneration and with a great affection, though his habitual reserve caused them to keep their feelings in restraint. Among them he is always spoken of as 'Bapooji'—the little father—a name bestowed upon him by a sister,

ten years his junior. He was kind, without being indulgent, and would not permit his children to waste time or money. His elder son, when at Cambridge, was not given an allowance, but, so long as money was carefully spent, could draw freely on his father's purse. In boyhood Dorabji Tata was frequently at his father's side, and was compelled each day to give a full account of his time, well aware that any prevarication would be punished by a few strokes from the cane. Now and again the father would unbend and play with him, or compel the lad to do some deed of boyish daring without the flicker of an eyelash. On one occasion, when the young Dorabji was balancing himself upon the parapet of a well, and every woman in the house was screaming for him to come down, the father came out, and assured them of his son's safety by encouraging the boy to take a further walk along his dangerous perch. If Mr Tata were told that he was spoiling his nephews by giving them money, he would retort that they should learn how to spend it. His nephews loved him, and looked forward as a great treat to those occasional Sunday afternoons when they were solemnly ushered into the study, and had to give an account of their week's work, over ice-creams and cups of tea.

In later life, however, Mr Tata, at times, stood aloof from his household, and seemed somewhat stern and unbending. He retained the patriarchal traditions of the older school. To his subordinates and servants he was both a just master and a generous friend. His family always bowed to his judgement, well knowing that he was ready to grant any reasonable request. He had, however, set himself a high standard, and forgot, at times, that others were not possessed of his insight, his capacity for toil, or his power of making everything subservient to the business in hand. Now and again, he showed traces of impatience and irritability. When he was abroad, an insufficient explanation of affairs from the Bombay House would call forth an explosive reply. 'On the face of your letter,' he once

wrote to his son, 'the mess you had evidently made was patent. I do not know how sufficiently to characterize such neglect.' Or again: 'You say that owing to being constantly disturbed by people at mail time, you could not concentrate your thoughts and write clearly. May I suggest that such matters as these do not require to be referred to only at the last moment, therefore such letters can, without any inconvenience, be written or begun even one or two days before mail day, and any new or important matter added on at the last.'

If he felt himself to be in the wrong, he would give way with a good grace. After an impatient outburst he was always prepared to accept an explanation, and his reproaches were redeemed by his keen sense of justice. 'I must again express my regrets,' he wrote on the same subject, 'that owing to some hasty conclusions I have been led to think unjustly, and make unjust remarks about some of you in this connexion.' To his son Dorabji, who on this particular matter was in the right, and felt aggrieved at his father's rebukes, he added: 'But this only serves to show me that your heart is in this work, and it gives me tremendous hopes of the success of our project, as I know very well how you can work about anything you have set your heart on. Mind,' said he, 'this is not only for the good and benefit of our firm or family, but for that of our community.'[1]

Such a letter reveals the unobtrusive loyalty which regulated the Tatas' family life. In writing home, 'Bapooji' was content with a few conventional expressions of affection, and a few inquiries after the health of the household. His heart was not worn upon his sleeve. Only once did he lose his equanimity, showing the greatest concern when he feared that his elder son had been killed in the Golvad accident. As a rule he was undemonstrative, but he knit together his kindred by a bond of respect. Though his mother and sisters, his wife and his sons' wives, shared his constant care,

[1] Letter Book of 1893.

his womenkind would wait outside the library door until they had gathered courage to disturb him. Such a visit, though often upon a trivial matter, was known among them as 'an appeal to the High Court'. 'Bapooji', indeed, often sat alone, but his influence pervaded the quiet household.

His homes were to him a source of great pleasure. Every feature of Esplanade House was of his own design. He frequently visited his various estates at Matheran, Navsari, Ootacamund, Panchgani or Bangalore, where he conducted all kinds of experiments in cultivating plants or breeding mules and different animals. As a rule he would take with him some friend who was interested in similar hobbies. When December came round, it was Mr Jamsetji's custom to invite his family and friends to the home of his birth. At Navsari he had two houses, and on these occasions the old house in the town was set apart for his wife and her companions, but all the men stayed at the house in the park, and drove down to Navsari in any kind of carriage for their meals. Every morning the host was in his garden at six o'clock, planning new arrangements or changing old ones. At Christmas-time 'Navsari week' began. Parsee families came down from Bombay, and fashionably-dressed folk filled all the available houses. Mr Tata was the squire of the place. He had given the inhabitants a small public park and a well-stocked menagerie. His father, his cousin, R. D. Tata, and he had endowed three schools, while in many another way Navsari was indebted to the purse of the family. For a week the inhabitants of the little town put on gala dress. School-children received their prizes, the older people their presents, and the festival terminated with sports and general gifts of garlands.

Apart from these ceremonial occasions, Jamsetji Tata rarely went into society. Despite the numerous houses and goods which he possessed, he enjoyed his wealth in simple fashion, leading an unostentatious, but a comfortable life. In the expansion of his various schemes, and the development of his philanthropic

projects, he found his real interests. Except when travelling, he rarely rested; absence from the office was to him irksome. Save on Sundays, and one or two of the greater celebrations, the work of Tata Sons never ceased. Were an extra holiday forced upon the firm, Mr Jamsetji would go to Victoria Buildings alone. Morning and evening he allowed himself a few innocent recreations. He rose betimes, and took a short walk along the sea-front. As early as eight o'clock he would order round his favourite carriage, a little victoria, and visit his friends, frequently before they had risen. After the family breakfast he then read or wrote. At midday he went down to the office and remained there until six o'clock. When the day's work was over, he either took a drive or spent an hour or so at the Elphinstone, where he played a quiet game of *chowpat* or conversed with his cronies. On returning home he enjoyed his dinner to the full, and then, as a rule, retired to his study and his books.

Save for his love of reading, he had not many diversions. He had neither the leisure nor the inclination for an outdoor life. He read, however, numerous books upon sporting subjects, and took a fatherly interest in the Parsee Gymkhana Club. He was the first to interest his son, Dorabji, in athletics, and encouraged him to pursue them while at Cambridge, talking with fatherly pride to his English friends of the success which his boy achieved in obtaining his college colours for cricket and football, coxing one of the college boats, and winning prizes on the cinder-path. He was fond of driving, a good judge of horse-flesh, and duly proud of his well-bred Arabs, English Hackneys or Hungarians, and of his smart turn-out. At times he enjoyed sailing or boating, and entertaining his friends at picnic parties.

On the lighter side, however, his life was always full of interests. Mr Jamsetji resembled the aristocrats of the Restoration period, who combined a full political life with manifold curiosity and delight in anything new. He looked ahead, even in his most trivial purchases.

Mr Tata's travels were timed, as a rule, to coincide with some Great Exhibition, where he saw inventions, large and small, with which his country was wholly unacquainted. He loved an ingenious device. Though he cared little for music, he bought an electric piano for his home. When the cinematograph first appeared, he acquired one at once. He was a born pioneer. His purchases were made, not so much for himself, as to let India know what was new in the great world across the seas. His carriages were the first to be fitted with rubber tyres, whose silent progress amazed the crowd. In 1901, he brought a motor-car out to Bombay, and delighted in taking his friends on uncertain excursions to which a breakdown only added a spice of adventure. He would not have a chauffeur: his coachman had to learn to drive, and when the car failed there were plenty of coolies to haul it home. Someone had to handle these hobbies. So Mr Jamsetji selected a servant, to whom he gave a few months' training in mechanism, until the man could adjust defects with varying success. When Mr Tata bought his first Diesel engine it had been set going before the German engineer arrived to piece it together. For Mr Jamsetji did not believe in importing experts. 'Let the Indian learn to do things for himself,' said he.

These minor interests filled up Mr Jamsetji's odd moments, but his favourite hours were those spent at home among his books. He was an omnivorous reader: more than that, he had an excellent memory and a methodical habit of taking notes. He enjoyed reading history, and the memoirs of notable men, but his reading was not always of a serious character; he was fond of novels and of humorous writings. His favourite authors were Dickens and Thackeray, in whom he found a constant source of recreation; next to the two Englishmen, he delighted in the broad humour of Mark Twain and the vigorous stories of Bret Harte. The cadences of poetry pleased his ear. He read aloud, and read well. When Lady Ramsay, during her visit to India, had been

entertaining a few of her friends with readings from Browning, Mr Tata quietly took the book from her hands, and read, in a sonorous voice, the 'Grammarian's Funeral'.

He admired the English language, making it largely his native tongue, writing it with ease, and without those elaborations which are so common a characteristic of Indian style. His friends recognized him as a fascinating talker. He loved amusing stories, which he would hear or relate with twinkling eyes. In lighter mood he gave full play to his powers of sarcasm, which were sharp but not malicious, for his caustic wit was tempered by a kindly soul, and a genius for friendship. His journal reveals a strain of scepticism; he was more eclectic and less orthodox than his father. All who heard him, in his hours of relaxation, were impressed by his great versatility. Without obtruding himself upon an audience, he could always attract one. On a journey to America the enforced idleness gave him abundant opportunity for conversation, and he would talk of the stars, or of flowers or of his travels. Gradually he cast a quiet spell over all those who heard him, and, as the voyage progressed, his circle steadily grew, until men and women, youths and maidens, abandoned the regular routine of life on board ship, in order to listen to the benign-looking Parsee who sat in their midst.

To his love for literature he added a fund of general learning. He could easily digest the contents of a political book, or a book of travel, and then turn to technical or erudite subjects, ranging from horticulture to the newest philosophy. As an American once said, Mr Tata's knowledge appeared encyclopædic.[1] He devoted himself to any current interest. When his illness caused him keen anxiety, he set himself to master the intricacies of his disease; when bimetallism was a burning

[1] The same informant wrote: 'It mattered not whether it was history or philosophy, religion or science in any of its many developments, he was equally well versed, and whenever he spoke on any subject he always had eager listeners.' (Mr R. W. Paterson of Blantyre, Mass., to Sir D. J. Tata, 23 May 1904.)

question, he studied the theory of economics; and when the bubonic plague was at its height, Mr Tata worked up the history and treatment of different plagues with a view to understanding the most suitable methods of preventing the spread of infection.

Diverse as were his interests, he was by no means a mere dilettante; but rapidly acquired a firm grasp of any subject to which he gave his attention. Even during his last illness his mind was, at times, still clear, and his faculties were unimpaired. Towards the end, Sir George King, who had formerly been curator of the Botanical Gardens at Calcutta, and had written learned monographs on Indian plants, expressed a desire to meet Mr Tata. He was staying at the same hotel in San Remo, and was taken to the sick man's room, where at least an hour was spent in conversation on Indian arboriculture. So impressed was Sir George by Mr Tata's knowledge that, on leaving the invalid, he turned to Sir Dorabji and exclaimed: ' I am surprised at the marvellous information your father has on all things connected with what I thought was my line. Though I am a botanist, I learned several things from him.'

A similar incident happened after Mr Jamsetji moved to Vienna, only a month before his death. A certain Herr Hugo Schweiger, a paper-manufacturer, approached Mr Tata and his son with a view to renewing a contract for the paper used in the packing and bundling of yarn. His firm had already supplied the Svadeshi Mill with trial parcels, but the Austrian paper had been found neither so cheap nor so serviceable as the English product. Herr Schweiger, however, persisted in his endeavours to obtain a large order, but the younger Tata explained the unfavourable results of the experiments he had already made, and declined to purchase more. Herr Schweiger's persistence quickly brought him a long disquisition from Mr Tata, who had studied the subject unostentatiously for over twenty years; the older man knew every process, from the pulp to the finished product. The abashed Viennese went away, amazed at the knowledge of his

prospective customer, and too greatly humbled to repeat his request for an order.

This interview proved to be Mr Tata's last effort of the kind. His premature death was due in part to his one form of indulgence. Abstemious as he was, he delighted in the pleasures of the table, and paid great attention to his food. He played tricks with his digestion, eating, day after day, rich and highly-seasoned dishes. Though he studied his own ailments, real or fancied, stacking the shelves of his library with medical works, he paid little heed to their advice. When his doctor, or his family, warned him of his indiscretion, he always replied, 'I think I could digest a stone.' He over-estimated his power. In his later years he suffered great inconvenience from shortness of breath and fatty degeneration of the heart, brought about by his particular weakness.

Even at fifty years of age he wrote of himself as 'an old man', but, blessed as he was with a robust constitution, he could then work with all the energy of youth. At sixty his health began to fail. He found great difficulty in climbing a flight of stairs, or in descending from his carriage, but he deliberately refused the help of a proffered arm. When his sons wished him to allow the servants to carry him up and down, he would never do so, as he disliked to be conspicuous, or to appear 'fussy'. At the Elphinstone Club there were two flights of stairs to be climbed; every day, to his last visit, he insisted upon this unnecessary task, though his doctor had warned him against undue exertion. It needed much persuasion before he permitted a chair to be placed on the landing, where he would rest for a while, protesting that he would not coddle himself.

Had he done so, and taken more heed of the advice so freely tendered, he might have prolonged his life, but as he approached the age of sixty-five Mr Tata's ailments gathered to a head. Even then he would not temper his appetite, and his excesses at length brought on a plethora. He suffered from sleeplessness; he

breathed with difficulty, and was racked with the dull pains of dyspepsia. Day by day his heart became weaker. Despite these complications his medical advisers still preserved a hope that he would live for some years, but Mr Tata was a difficult patient to diet; to a man of such great activity, both of body and mind, all restrictions were irksome, and he was ill-suited to an enforced rest or change of habit.

Whatever medical science could do was tried in his case; and eventually his doctors decided that he should take the cure at Bad Nauheim, a German watering-place much frequented by subjects suffering from ailments of the heart. But Mr Tata was by no means disposed to regard their advice; in the first months of 1904 he had made up his mind to visit either Burma or the Persian Gulf. Though pressed by his relatives to go to Europe, he replied with the impatience of an invalid. 'No, no, I want to go to the Persian Gulf.' At length his cousin, Ratanji, tried a ruse, and pleading ill-health himself, persuaded Mr Tata to accompany him to Egypt for a fortnight, saying that the change would do them both good. Mr Tata may have welcomed the suggestion as a means of graceful withdrawal from his projected tour. He refused, however, to take a medical man with him, though he already recognized that his health was rapidly failing. But he disliked excessive care, 'a fuss', as he called it, and thus laid a burden of responsibility on the shoulders of his family.

Fortunately some members of the family were close at hand. Sir Dorabji and Lady Tata were already in Egypt. As soon as they heard of their father's coming, they hastened up to Suez to meet the boat. If Mr Tata really thought that his companion was the invalid, he was speedily disillusioned, for within the next six hours his cousin re-embarked for India. He and his son and daughter-in-law went on to Cairo, where the change of surroundings seemed to do him good. For a time Mr Tata's mind was awakened. He took advantage of a casual meeting with a business correspondent to discuss

arrangements for developing his trade projects in the Levant. But the old waywardness, which he always showed in regard to his health, soon began to reassert itself. He neglected his doctors' orders, and became impatient of correction, though he would at times listen to his daughter-in-law, for whom he had a great affection. Unfortunately other influences were at work. Wherever Mr Tata went he was accompanied by a Goanese personal servant, Abel. The man persuaded his master to employ a masseur who was attending upon another resident in the hotel, but the new treatment did little except encourage the invalid to go his own way.

After about a month in Cairo his son decided to take the patient to a famous Viennese physician, Dr Nothnagel. As Austria, in February, would have been too cold, the physician suggested a meeting at San Remo, where he was proceeding in a few weeks' time. In accordance with this arrangement the little party moved to Alexandria and sailed thence to Naples. While they were there Mr Tata received the news of his wife's death. Mrs Tata had been ailing for some time, but when her husband left Bombay she had appeared somewhat better. At length she succumbed to a paralytic stroke. Her husband bore the news sufficiently well, but his senses were at the time somewhat dulled. Some days later, however, he was able to dictate a long and thoughtful letter to Lady (Ratan) Tata, committing to her care his invalid sister and two of Mrs Tata's nieces. He then arranged, with his younger son, that Rs35,000 should be set aside, in order to pay tribute to his wife's memory by founding a fund for midwives in Navsari.

By that time his own state of health was one of the gravest anxiety to those around him. His condition became more serious, the œdema more pronounced, and it was necessary to tap his legs in order to reduce their swelling. From Naples he and his son came to Rome, and thence by slow stages, through Florence and Genoa, to San Remo, where they arrived just as April began.

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At length Dr Nothnagel had an opportunity to diagnose a case which was already well known to him by advices from Bombay; he was constrained to take a very grave view of the invalid's condition. Still Mr Tata had periods of revival, when he became an impossible patient. His passion for inquiry into the customs of the country was too strong; stimulated by curiosity, he must needs go to a restaurant for the poorer classes to see how they fared in San Remo. In the market-place he loaded himself and his servant with figs, dates, and all manner of fruits, which he ate with relish. As though he were twenty years younger, he began to consider the possibilities of cultivating the date in India, and tapping the Italian palms for 'toddy'. During the last weeks, he bought hundreds of fruit trees for his estate at Panchgani; some white peacocks for the gardens at Navsari; and a pair of wolf-hounds, and some small Italian greyhounds, which he chose for their 'high-stepping action'. Then he arranged to purchase a number of Bosnian and Croatian horses, some for the hotel and some for his own use. A dozen other matters kept him busy, and almost his last letter was an order for two oil-driven motors to drive a yacht, which he was building, for one of his hobbies, in Bombay.

These outbursts of vitality, and of esurient indiscretions, made him the despair of his physician, who was greatly relieved to see his patient safely in the clinic at Vienna. There Dr Row, the family doctor, joined the party, and though all had realized that there was little hope of a permanent cure, Mr Tata kept a tenacious hold upon life. Indeed, as his ill-health increased, his mind at times renewed its strength, and during the last few weeks he showed long spells of his old powers of conversation and his intellectual activity. About the second week in May, he and Dr Row moved to Bad Nauheim, while his son remained in Vienna to undergo a slight operation. Meanwhile his cousin, Mr R. D. Tata, arrived at Nauheim, and during the last days became his constant companion. One of Mr

Jamsetji's nephews, who was studying in Berlin, and a friend, Mr Kanga, a Bombay lawyer, joined the little suite. Though the patient was very feeble, there were no signs of immediate danger. From time to time he would rouse himself and show a fitful interest in the world's affairs.[1] A favourable report upon the Empress raised in him a spark of his old enthusiasm. He talked to his cousin about the aims which had actuated his life, and constantly expressed a wish that his sons and his cousin should carry on the work. To follow Mr Tata was no light task. He was reminded by 'R. D.' of the honour which he had brought to the family name. 'If you cannot make it greater,' was the reply, 'at least preserve it. Do not let things slide. Go on doing my work and increasing it, but if you cannot, do not lose what we have already done.' At times he chatted about the estate at Navsari or about his home affairs. During another interval of consciousness he referred to his youngest sister, the mother of the nephew who was then with him. For her he had a great affection, and he commended her to the care of his sons and cousin, a trust which was honoured until her death.

Towards the end Jamsetji Tata knew that he was dying, but said that he did not fear death. He was one who could contemplate the past with satisfaction and the future with hope. God, said he, was always very kind to him, and had left him amply satisfied in all respects. He only wanted to see his two sons; his 'dear lads' as he called them. 'Where are you, and why don't you come to see me?' he cried piteously. On 17 May he suddenly took a turn for the worse. 'Where is Dorab?' he said again and again, 'Where is Dorab?' His son and daughter-in-law were at the moment hurrying from Vienna, whence they had been hastily summoned. Hour by hour Mr Tata was sinking

[1] 'Even up to the last he took the deepest interest in Japan, and was enthusiastic about the brilliant achievements of the Japanese forces, and believed in their success.' (Sir D. J. Tata to Baron Shibusawa, 13 August 1904.)

rapidly, and was only intermittently conscious. During a brief interval of understanding he made one of those dispositions of personal property which enhance the comfort of a dying man and the pleasure of the recipient. He had long possessed a watch which contained his mother's portrait and a lock of her hair; and before his death he handed this to her nephew, his cousin Ratanji. On 18 May Sir Dorabji and his wife arrived. By that time the dying man was comatose, but he had made an effort to live until their arrival, and spoke to them a few affectionate words. 'Where were you, where were you?' said he to his daughter-in-law, and he stroked his son upon the cheek. On the following morning he passed away in his sleep. It was 19 May, the anniversary of the death of his political hero, Mr Gladstone.

Within a few hours the news was received in Bombay. That same afternoon a number of his friends and admirers called at Esplanade House and offered their condolence to the family. Three days later the *Oothumna*, the third day obsequies, were held there in the presence of 400 Parsees, mostly of the priestly class. The High Priest of Navsari, Dastur Darab Mahiarji, recited prayers and commemorated the illustrious dead. Tributes poured in from every rank, and every country in which Mr Tata was known: from America, from Austria, from England and from Japan. Public bodies passed resolutions lamenting the death of a man of whom Lord Curzon could truly say that 'no Indian of the present generation had done more for the commerce and industry of India'.

The question of burial presented some difficulty, as the Parsee rites are of the strictest type. To embalm a body is against the tenets of their religion, but a German prepared some preservative which Dr Row injected into the veins. The body was then taken to England, and on 24 May, the remains were interred with all the picturesque rites of the Zoroastrian religion. The prayers of the Zend Avesta were recited by his son and his cousin, and some of the family fed the sacred fire with sandal-

wood. After the coffin was lowered into the ground, each mourner passed by, and cast upon it a handful of earth. Sir Dorabji and Lady Tata, Mr R. D. Tata, Mr Behram Saklatvala, the nephew, most of the prominent Indians resident in London, and a few English friends, attended the funeral.

The grave is in the cemetery at Brookwood, where, shrouded by dark yew-trees, a mausoleum, built in the Persian style, lends a significant touch of the East to this sombre place. There lie the remains of Jamsetji Nusserwanji Tata. One patch of English soil should be sacred to Englishman and Indian alike. It was fitting that a man, 'still loftier than the world suspects', should lie so near the Empire's heart. Many a merchant also lies within hail, but among them there is none who could excel this man in honesty, industry, or simplicity; and few whose death left a greater blank in the lives of those who knew them well.

CHAPTER XIV

SUMMING UP

It was not in vain that Jamsetji Tata, on his death-bed, exhorted those who followed him to preserve the name of the House, and to pursue and increase his work. Plans which in his life-time may have seemed somewhat visionary were rapidly completed. Within a few years his latter-day schemes passed from immaturity to fulfilment. Though his two sons were not constrained to carry out his wish in founding the Institute of Science, they immediately announced their intention of obeying his behest. Within ten years of his death the Institute opened its doors, and the Iron and Steel and Hydro-Electric schemes were paying their first dividends.

Sir Dorabji, with the aid of his father's right-hand men, became chairman of most of the companies, and Mr R. D. Tata continued his invaluable part in the general management of the firm. Mr Padshah busied himself with the Iron and Steel Company, as well as with the educational project. The second son, Sir Ratanji, aided by Mr Bilimoria, took over the reclamation schemes and continued the development of the landed property. Though Sir Bezonji Dadabhai Mehta still remained at Nagpur, he was of the greatest assistance in the further development of all the mills. The two original companies became Tata Sons and Company. Several new companies were formed, until the interests of the firm had expanded to such an extent that it had become the largest concern in India, and had its branches or agencies in London, Paris, New York, Shanghai, Kobe, Rangoon, Calcutta, and other cities both east and west. The shares of the various companies promoted by the firm, or formed under its management, were sought after with such eagerness that the formation of each new offshoot produced a list of applicants which exhibited

unbounded confidence in the name of Tata. When, in 1915, Sir Dorabji was invited to preside over the Indian Industrial Conference, held in Bombay, he opened his address by thanking the members for the honour they had accorded to him. 'It is, I take it,' said he, 'not so much a compliment personal to myself, as to the firm of which I happen to be the head, and to the memory of my father, to whose breadth of vision and genius for organization it owes its position in the industrial world of India at the present day.'

By 1920 the firm was at its zenith, and a year later twenty-two separate companies were in existence. Some of these were unimportant and not wholly successful; some were private companies, and some were but agencies. So many were the extensions, however, that it was deemed advisable to build larger offices, and to house all the staff under one roof. In 1921 the Associated Building Company was formed, with a capital of Rs1,00,00,000 (£666,666), and towards the new premises, now completed in Bruce Street, each company has paid its proportionate share of the costs.

Of the companies conceived in Mr Jamsetji's lifetime, and founded or developed after his death, the two most important are the Iron and Steel Company and the Hydro-Electric. The capital of the Steel Company now amounts to Rs10,52,12,500 (£7,014,166), and various subsidiary industries, such as the manufacture of enamelled ironware, jute machinery, tin-plates, electric cables, wire-products, and agricultural implements, have already been established. The hydro-electric schemes have likewise expanded, and the firm has already surveyed the Koyna Valley, some fifty miles south of the works, where a large valley lies ready for submersion in times to come. Beginning life with an original capital of Rs1,75,00,000 (£1,166,666), the Hydro-Electric Company now has a capital of Rs3,00,00,000 (£2,000,000). In addition, the Tata firm inaugurated and established the Andhra Valley scheme based on a capital of Rs2,10,00,000 (£1,400,000). In 1919 the Tata Power

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Company was floated with a capital of Rs9,00,00,000 (£6,000,000).

These are stupendous figures, yet make up only a fraction of the capital which the firm controls. When Mr Jamsetji put a few thousands into the Empress Mills, he could scarcely have dreamed of the figures which his initial enterprise made possible. The capital now exceeds 75 crores of rupees, upwards of £50,000,000. Though the Tatas have suffered in the past two or three years from the general depression which has affected all industrial concerns, they have gone ahead. Besides the great companies already detailed, the firm has floated companies for building, engineering, cement-making, and the manufacture of oil, in addition to an Insurance Company and an Industrial Bank.[1]

None of the greater projects was allowed to lapse. After Mr Jamsetji's death his two sons continued the scholarship scheme of 1892, which is not yet self-supporting, and they at once surrendered the properties from which the Institute of Science derives much of its income. When the Institute opened its doors to the first batch of students, the buildings were still unfinished, but housing accommodation had been prepared, and some of the laboratories were sufficiently equipped for commencing work. The library was temporarily housed in the south wing of the electrical laboratory. Two departments were opened: one for chemical research,

[1] It should be noted that all the Hydro-Electric Companies were floated after Mr Jamsetji's death. The Andhra Valley Company has issued debentures up to £1,000,000, and the Tata Power Company has issued debentures of £1,750,000 of which £1,000,000 are guaranteed by the British Government under the Trade Facilities Act. In addition the Kundley Power Company was launched in 1923 (as an extension of the Hydro-Electric Company) with a capital of Rs50 lakhs subscribed by the existing Hydro-Electric Companies and has debentures of Rs50 lakhs.

Other large companies founded by the firm in recent years are (1) The Tata Industrial Bank, with an authorized capital of Rs12,00,00,000 (£8,000,000); (2) The Tata Oil Mills with Rs1,00,00,000 (£666,666); (3) The New India Assurance Company with Rs20,00,00,000 (£13,333,330), but this authorized capital was reduced in 1924 to half that sum.

the other for electro-technology. In the following year a department for the study of organic chemistry was able to begin work. The various laboratories were well supplied with apparatus, oil, gas, water at high pressure; and electric mains, at various voltages, were installed throughout the buildings. The department of general chemistry possessed a well-equipped workshop, and a machine-room containing a lathe, a liquid oil plant, a motor generator, and other machines. In the department of applied chemistry the laboratories were equipped so as to afford every facility for analytical work, technical research, and the carrying out of any of the operations of manufacturing chemicals on a commercial scale.[1]

Unfortunately the equipment was unequal to the demands which were made upon it. Though no expense was spared, experience was necessary before the needs of the Institute could be fully realized. Some of the newly-fledged bachelors of science were impatient to complete their research, and to show to the world what Indians could do. They were eager to embark upon types of investigation so varied in their scope that the preparation of years could hardly have satisfied their requirements. The more experienced professors had, in their day, spent much laborious time upon research, and were prone to curb the excessive enthusiasm of youth. After eighteen months' work the malcontents entered an elaborate protest against the leisurely way in which, as it seemed to them, the affairs of the Institute were conducted. They expected to find the laboratories fully equipped with every conceivable scrap of apparatus. They refused to give the organization time to mature, and chafed at the delay. At length they drew up and printed a memorial of their complaints for the information of the Council.[2] It needed considerable tact upon the part of the governing body to restore a proper sense of discipline, but within a few weeks the Institute

[1] Calendar of the Institute, 1911-12, 1912-13.

[2] *Memorial and Representation of Some Students*, etc., (Bombay, 1913).

weathered the only storm which has disturbed the tranquility of its corporate life.

Each successive year has been marked by steady improvement, both in the range of work and in the efficiency of the equipment. The two departments for chemical research are unusually well furnished, and the technical side of the laboratory is as extensive as that in any similar institution. Many experiments can be made with the actual plant used in the factories, enabling the commercial value of an investigation to be thoroughly tested.

It is the object of the Institute to assist the Indian manufacturer, but it is in no sense a trade school, 'and', as the Director said, 'cannot deal with what may be termed the minor manipulative processes of particular industries'.[1] But help to industry is given in various ways. Raw materials are analysed, and their suitability for a given purpose is determined. Experiments are made in order to effect improvements in an existing process, and processes which are new to India are thoroughly investigated before being put to the factory. If necessary, an experimental plant is erected, estimates of the cost of production are drawn up, and a report is made as to variable local conditions. The first experiment made on these lines was that of the distillation of sandal-wood oil for the Mysore Government. In order that the necessary data might be obtained, small stills and condensers were first constructed, and afterwards a unit of commercial size was erected and tested. Experiments were made on the most suitable machinery for reducing the wood to powder, and from these results the plant for the factories was designed, and was made in India.

Such experiments are, of course, expensive, but they are, as a rule, financed by governments, or by private firms, who pay for the special apparatus and the raw material, contributing to the salaries of those who carry out the experiments. A chemical factory

[1] *Report of the Director to the Provisional Committee.*

has been designed for Bengal, and a thymol factory has been started on the basis of experiments made and scheduled at the Institute. The laboratories are fitted with complete plant for the production of bichromates, white lead, sodium, bisulphate, hardened oils, aluminium, and caffeine; the production can be carried out on a scale which affords data for industrial purposes.

The Institute has, of late, prepared to specialize in electrical technology, by providing students with a course of study on the lines of the advanced University teaching. For this course the equipment is of an unusually efficient character. Excellent instruments are available for testing the reliability of commercial appliances; a machine was used, during the war, in testing the timber for aeroplane construction, and the latest acquisition is an electric furnace which will be used in investigations dealing with the manufacture of aluminium. Adequate plant is available for the study of the generation and transfer of electricity, the transmission of power, and all questions which affect electric lighting and traction. During the long vacation the students in this department are assisted to obtain practical experience in engineering works and generating stations.

In practical work the Institute is of undoubted value to Indian industry. It was Mr Tata's aim to train students in such a way that the actual effects of their work should be beneficial to the country. Hitherto the chemist had frequently looked at a chemical operation without regard to the cost, but the Institute has enabled its students to investigate a process as a commercial proposition. With this end in view, much has been done towards the proper classification of the raw materials of India.

The average number of students is about sixty, half of whom are in the department of general and organic chemistry. The majority have taken degrees at Indian universities, and some have gained diplomas at Oxford or Cambridge. In many cases the men remain at Bangalore to complete some particular piece of research,

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which may occupy from three months to a year. As a rule, those who remain but a short period join the Institute for the facilities which it affords to complete investigations on which they have already embarked; others are professors, or lecturers, who wish for a few weeks of quiet study, such as they would undertake during the long vacation at the English universities. Others remain for longer periods, generally two years, which is the time officially recommended for a full course. On the completion of their research work, they obtain appointments. Of fifteen students who left in the same year, three continued their research in Europe or America, four went in for teaching, four obtained Government appointments, and four went into business.

In the future it is hoped that the Institute will prove beneficial to industry. The analysis of certain raw materials can frequently be made more successfully in India than in England. During the war of 1914 the chrome iron-ore exported from southern India was analysed at Bangalore, and on the basis of this analysis part payment was made immediately upon shipment. In addition, the Institute can provide merchants with valuable information as to the quantity, quality, and price of raw materials, and is equipped for the preparation of samples of new and little-known oils and drugs.

To one essential necessary for successful research the Institute is fully alive: everything has been done to make the library of service. Complete sets of scientific and technical journals dealing with chemistry, electrical engineering, and physics are added as they appear. Classes in French and German are held under the supervision of the librarian, and each language is studied with special attention to its technical vocabulary. When so requested, the library provides other institutions with translations of important articles appearing in scientific periodicals.

So great a conception was at first bound to fall somewhat below the ideals of the founder, for few universities have developed a vigorous life in a brief space of time.

In 1915 Sir Dorabji Tata, in speaking of the Institute, drew attention to his father's view of what the foundation should be. 'He intended it,' said the son, 'not to be a glorified technical institute, turning out a few indifferent chemists and electric operators, mainly intent upon making a living for themselves, but a sort of nursery and training-ground to inculcate the spirit of original and specific research in different branches of science and industry, which might ultimately serve as a means for the development and prosperity of the country.'[1]

In order that his father's ideals should be attained, Sir Dorabji Tata arranged with the Government of India for a review of the work already done. In 1921, after the Institute had been open for ten years, a Committee was instructed to report upon its activities and to make recommendations for its future well-being. The Governor-General in Council appointed as Chairman Sir William Pope, the Cambridge Professor of Chemistry, assisted by Sir Ashutosh Mukharji, Sir Henry Hayden, and Professor C. V. Raman of Calcutta. They found in some quarters a strong current of disappointment and dissatisfaction with the condition of the Institute. Some witnesses were aggrieved that no steps had been taken to secure the appointment of Indians to the higher posts. In earlier years the relations between the staff and the students had been none too cordial, and this had adversely affected the work. It was found that the private practice undertaken by some of the staff had not been conducted upon lines which enhanced the reputation of the Institute. The Committee, however, turned their attention to reformation rather than to an investigation of past errors.

One difficulty to be faced was the age at which the Indian student terminates his scholastic career. He lacks the necessary training or experience for adequate research work. The Committee therefore recommended the institution of various courses which would

[1] Speech at the opening of the Indian Industrial Conference (December 1915).

serve as a link between the student's previous work and the research to which he intends to devote his time. Advanced instruction was to prepare the way for original investigation. Further, the Committee considered it undesirable that research should be confined to matters which bear on the application of science to industry. They wanted to raise the standard and volume of the training provided, and to arrange for the admission of suitable persons who desired to carry out independent research. The remainder of their recommendations were mainly devoted to suggestions for new departments and new professorial chairs; to the re-organization of the constitution; to more effective arrangements for the appointment of the staff; to the provision of a certain number of quarters for those students who were already married; and to more liberal facilities for social intercourse and recreation.

Some of these recommendations have already been carried out, but the subsequent history of the Institute of Science requires only the briefest treatment, since a full account of its progress has recently been published.[1] In the main the details are purely technical, but it is evident that the Institute is, by slow degrees, treading in those paths which the founder desired. It has at least built up the character of many a young Indian; it has inculcated 'clearness of thought, habits of industry, perseverance in face of disappointments, and precision of craftsmanship'. Equal attention is now paid to research in practical and purely scientific subjects. Direct application of science to industry is, however, the main work of the place. At least five factories owe their establishment to results obtained in the laboratories at Bangalore. Two are for the extraction of sandal-wood oil; a third is for the manufacture of white lead; a fourth for the making of high-class soaps; and the fifth turns out lead pencils. Many experiments have been made for the distillation of wood, and much time has been

[1] Prospectus of the Indian Institute of Science, Bangalore (Madras, 1923).

devoted to the production of high-grade from crude salt. Advice has been given to Government departments as well as to firms, with the result that, from time to time, the Institute has been able to prevent the fruitless outlay of large sums of capital. During the session of 1922-3 the number of students was 100, and already some 300 post-graduates have availed themselves of its advantages.

Both Mr Jamsetji's sons inherited their father's interest in the Institute of Science, though certain proposals which they made did not mature. In 1912 Sir Dorabji Tata proposed to endow a School of Research in Tropical Medicine in India, a subject which he regarded as valuable alike to the cause of science and to the progress of his country. He was fully prepared to associate his scheme with Bangalore, but as he did not receive the necessary support, he allowed the matter to lapse.[1] Later on, again he offered to endow a school of Tropical Medicine and Hygiene in Bombay, and an Institute of Medical Research at Delhi, but the Government, owing to the necessity for retrenchment, was compelled to refuse his offer. Sir Ratanji Tata also offered to found a School of Sociological Research in connexion with the Institute, but the offer was coldly received, and was therefore withdrawn.[2] These rebuffs did not, however, deter the sons from conducting expensive investigations into schemes which they judged worthy of assistance. Sir Dorabji endowed a chair of Sanskrit at the Bhandarkar Institute, and has subsidized the researches of many a deserving scholar, particularly those who desire to throw further light upon the history of the Parsees. Both took a practical interest in the education of women. Sir Ratanji, at a time of distress, assisted those Indians who were in conflict with the South African Government. Their benefactions were not confined to their own land. Within recent years Sir Dorabji gave £25,000 to the University of Cambridge

[1] *A Scheme for Endowment by Sir D. J. Tata of Research in Tropical Medicine*, by Leonard Rogers, I.M.S. (London, 1912).

[2] Mr B. J. Padshah to Mr Lovat Fraser, 27 August 1912.

for the equipment of laboratories in the School of Engineering. Afterwards the donor received a signal honour, for he was elected an Honorary Fellow of his old college, Gonville and Caius, a distinction held only by eight other men, and by no other man born outside Europe. Sir Ratanji, who was in delicate health, spent his later years in England. He endowed the Ratan Tata Foundation at the London School of Economics for the purpose of spreading a knowledge of Social Science and the causes of destitution. His trustees have carried on all his philanthropic work.[1]

Less than fifty years have elapsed since the firm was founded; and now, close upon a quarter of a million souls, wage-earners and their dependents, owe their livelihood to its great expansion. Among the present generation of Indians, Jamsetji Tata may seem but a dim recollection, though his life serves well to illustrate the industrial development of his country. His memorials are spread over India: the flourishing town of Jamshedpur; the great mills at Ahmedabad, Nagpur, and Kurla; the submerged valleys of the Western Ghats, and the Institute of Science at Bangalore. They remain his noblest monuments, and set an example of achievement to his countrymen. After his death he was one whom his fellow-citizens delighted to honour, for they knew the man, and appreciated to the full his resolute character, his kindness of heart, his quiet but dominating personality, and the great services which he had rendered to India. Early in 1905 a public meeting was convened in Bombay to consider how his memory might best be perpetuated. It was at length decided to erect a statue of Mr Jamsetji on a site not far from Esplanade House.[2]

On 11 April 1912, the statue was unveiled by the Governor of Bombay, Lord Sydenham. He had never

[1] In his later years Sir Ratanji Tata resided at York House, Twickenham. He died on 5 September 1918.

[2] At the junction of Waudby and Cruickshank Roads. The statue was designed by Mr W. R. Colton and cost £3,000.

met Mr Tata, and relied, for his conception of the man, on those who had been more fortunate. One friend in particular, Sir Lawrence Jenkins, had, on a previous occasion, framed a brief estimate which outlined the character of Jamsetji Tata, and this sentence Lord Sydenham quoted: ' Wealth came to him in full measure, but he remained to the last what he was by nature, a simple, modest gentleman, seeking neither title nor place, and loving with a love that knew no bounds the country that gave him birth.'[1]

[1] *The J. N. Tata Memorial: Its Inception and Completion* (Bombay, 1912).

APPENDIX A

Mr Tata's Journal during his Travels in Palestine, 1873

Note: The journal was written in pencil, in a small pocket-book, and some of the words are now illegible. It is probable that there is a second volume, but this has not come to light.

Jaffa, Yaffa, or Joppa, as it is variously called, has a fine appearance approaching from the sea. The landing-place is very indifferent and sometimes dangerous (*vide* McLeod). We walked through, or up and down, the town to what is called the American colony. It was so named from a number of Americans [of] religious views coming to settle there some twenty or twenty-five years ago. On their arrival, with the characteristic go-ahead energy of their countrymen, they began building and planting on a fine airy spot to the north-east of the town. They also made a fair road from Jaffa to Jerusalem and began running an omnibus. But owing to some reason or other they did not prosper, and either died by fever or returned to where they came from, and their place has been taken by a number of German colonists. I had a talk with one of their elders who spoke English fairly. He said they were some 300 people, young and old, mostly Germans, but they had some English or Americans, and a very few Syrians, or the natives, among them. They were a colony of the Temple Community. There was another colony of the same denomination at Haifa, a town on the coast about 50 miles north. They say that, judging from Bible prophecies and the [? signs] of the times, they are led to believe that the end of the world is near, and the reign of Christ in Jerusalem likely soon to begin. In the marriage of the Lamb, the posts of Bride and the first and second witnesses are always objects of ambition to leaders of the numerous Bible communists in Germany and America. I think this to be an offshoot of the . . . etc. (*vide* Dixon's *New America*, and spiritual wifism). They have a sort of communism in certain respects, but I do not believe

they have the abomination called Spiritual Wifism and Free Love. They are a peaceful, industrious, and thriving community, most of them artisans, such as cabinet-makers, shoe- and harness-makers, smiths, tailors, etc. One of them who said he was twice in Bombay, once in 1859 and again in 1868, as one of the released Abyssinian captives, said he remembered seeing me in Bombay, probably a mistake. He had a photo of a Parsee family which resided in Colaba, and were his neighbours. I could not recognize any of them. He was very reticent about his religious views, turning the conversation whenever I returned to that subject. He was a nice, intelligent man, working as a cabinet-maker; seemed to have travelled a great deal and observed acutely. His reticence made me very suspicious about the secret tenets of the colony. The elder, above spoken of, said that God had commanded them to build the Temple for the Coming of Christ, and by this they understood the building of the Temple in man's heart—that is, cultivating equality and brotherly and sisterly (spiritual?) love between man and man of whatever condition or colour. An instance of which turned up immediately in course of conversation. The elder having apparently views about gathering a heathen to the fold, entered controversy with me, and having got excited after the usual vapid nonsense about faith, inner consciousness, and unexplained mysteries, I let in as a feeler the name of Strauss, which acted like an electric spark on an infernal machine, and brought forth a torrent of what may mildly be termed Christian controversial, savouring of the Bible precept of peace on earth and goodwill to man. Of course, strong remarks about the nationality of the infidel formed the basis of the mild arguments.

The hotel we stopped at was kept by one of the communists. It was a very nice, clean and comfortable place, the food was composed of only two or three good plain dishes, the charges too were moderate. The only lodger in the place besides ourselves was a Frenchman, who said he was there on account of an English Company, who were going to build a line of railway between Jaffa and Jerusalem. The surveys had all been completed, and they were going to begin next month. The line was

to be (?) metre-gauge and likely to cost £6,000 a mile. They were sure of a dividend of 7 per cent to begin with, but I could not see this, as there is very little traffic. I suppose the capital will be mostly subscribed through personal feeling: parsons and old maids, who found the ride between Jaffa and Jerusalem like a lion in their path, will unloose their purse strings, more especially when the hope of a 7 per cent dividend (to begin with) is dangled before their eyes.

For our own journey we had entered into a contract with a dragoman, Bisha Arvied (Christian Egyptian), to supply us with every necessary for a journey of one month through Palestine and Syria, to begin at Jaffa and end at Beyrout (*vide* copy of agreement: . . . Cairo, 15 May 1873, executed in presence of the British Consul). It was to be easy travelling, making about 20 miles a day, and my companion had everything explained to him—what sort of a trip it was going to be, how fatiguing to be on horseback continuously from day to day, and that the objects of interest to be seen valued more or solely on account of their historical and religious association than their own intrinsic merits as show-places or objects. But he was fired by a noble ambition to be among the first of his community to visit scenes and places which others more effeminate and ease-loving never thought of doing. But this resolution was made in Cairo, with the odour of tar and bad cookery on board the steamer still fresh in his nostrils; but the experience of his first three hours' ride taught him what his pedagogue probably never did before, that vaulting ambition hath its fall, and taught me what I did not know before not to put my trust in—never mind. To begin with our journey, the horses were brought overnight to our hotel from the encampment outside the gate for our inspection. They were a lot of good, small-sized Arabs with strong limbs and clean backs, fitted either to carry a pack or a passenger. We approved of them, though they had Arab saddles on, as these are more easy and secure for riders who did not dream of going beyond a jog-trot. Next morning they were brought before the hotel door, and we were hoisted up under encouraging hints, and speeded on our way under the blessing of the kind

German people—landlord, waiter, housemaid and all. Our way lay through magnificent groves of orange, pomegranate, peach, apricot, and other trees. The first was loaded with magnificent clusters of golden fruit, the place being famed in all Asia Minor for this grove of fruits. Leaving the orchards behind, we entered the plain of Sharon, one waving field of whose [? corn] was quite ready to be harvested. The road, too, was lined with a beautiful and variegated carpet of flowers, among them were most conspicuous . . .

Passing Lydd, or ancient Ludd, on the left, we stopped for lunch at Ramleh. Ludd, it is alleged, is the birth- and burial-place of St George, the patron saint of England. Over the tomb are the remains of a once splendid church, which is said to have been erected by King Richard I of England. Ramleh, too, must have been a considerable place once, as there were ample signs of ancient buildings come to ruins. There were the ruins of a large mosque which seemed once to have been a Christian church. We had some very bad drinking water at Ramleh. Our friend was quite knocked up coming so far as this for 10 miles. Within that distance he alternately tried riding and walking, half-a-dozen times expressing supreme disgust at the first taste of Palestine travel. Ideas of returning to Jaffa at once, or after visiting Jerusalem, began seriously to be mooted, and from that time commenced a series of grumblings and complainings which might try the patience of a saint. Everything was either too hot or too cold, too weak or too strong; the most sparkling, cool and pellucid waters had no taste. They were brought from two or three surrounding streams, but the first taste was invariably followed by a shake of the head. Poor Mohammed, the cook, was in despair; every dish he sent up was criticized: the mutton was overdone, and the fowl underdone. One day the rice was too pulpy, and the next too hard and gritty. And it seemed to be resolved that we should say good-bye to Palestine as soon as possible. We had advanced to our dragoman £100. Of course, the least the man would do would be to keep them and not insist on the fulfilment of the contract. I was quite in despair, and cursed my folly

in undertaking to carry round the world the Old Man of the Mountains, until a merciful providence, as it were, specially intervened to take my load off. At a wayside Khan, just outside the door as we passed I noticed a curious-looking oblong box of wood with two poles tied up to its sides as they do to a chair in China. I fortunately inquired of my dragoman the use of this curious-looking machine. He said it was a chair for carrying ladies on their travels. That it was tied on two mules, one before and one behind. I opened my eyes, and the thought struck me that this might procure a remedy for all the grievances of my friend. The dragoman, on inquiry, said that he probably would be able to procure one in Palestine, and I joyfully carried the news to my friend. But he had set his heart on returning, and said that, having trouble enough from one horse, he had no mind to trust his precious person on two mules. But after using some strong remonstrances, I induced him to promise that he would try it on an excursion we had decided upon undertaking from Jerusalem to Bethlehem.

We encamped for the night at a place called Bahr-el-evady, or the gate of the valley. It was not a very interesting looking place, being on three sides surrounded by bleak-looking hills which scarcely left enough room for our two tents, and a small house set up as a restaurant by a Jew. It was erected for the convenience of travellers, and containing three beds, would save a great deal of inconvenience and bother to those who had only to go up from Jaffa to Jerusalem. This place has been set up only the last six months.

Our tent was very nice and comfortable. It contained two rather narrow but strong and comfortable iron bedsteads, with good mattresses and clean linen. There were also small dining and dressing-tables, well furnished with clean towels and furniture of some fine, hard metal. As soon as we arrived we had a cup of tea, and at 7 we had a very good dinner, far better than we had calculated upon. We went to bed early and had a good sleep. Got up early in the morning at 5.30 and had breakfast of tea, eggs, bread and butter and jam, with plenty of milk. The packing was a sight worth seeing:

there was a great hubbub, but everything was done mechanically; while the cook and waiter were busy with our breakfast and packing the paraphernalia of the kitchen, the horse boys and muleteers struck the tents and divided the luggage into proper loads, well and securely tied. Everything to go in a certain load was fixed, and every load had its mule, which was to be inseparable when moving. We started off about 7, and the mules and baggage followed. Within half-an-hour we stopped for lunch on the way, but the luggage went on to Jerusalem. At Bahr-el-evady I saw growing in the cliff of a rock a fig-tree, the circumference of whose stem a few feet above the ground was nearly 7 feet. Having seen the fig-tree as a shrub in Bombay, I had always been puzzled why in books it was called a tree. I asked the dragoman if it was not a wild one. He said no, it was the ordinary fig-tree of the country, producing a large black fruit, and my subsequent experience bore this out. We went along the carriage road made by the American colonists; it was good in some, execrable in other places, even for horses as we thought then, but our subsequent experience of roads in Palestine convinced us that it was like Rotten Row compared to a Highland bridle-path. I suppose the roads of Palestine are specially made rugged and difficult by a Christian providence to prove by a toil of actual experience the contrary of the saying that the way to Hell is paved with good resolutions. Our experiences on the road were quite Oriental. The camels, donkeys and mules, with their drivers and loads, travellers resting on the wayside, did not impress us as it did in Egypt, Oriental picturesqueness, though dirty and tawdry, struggling through a veneer of European civilization in manners, dress, architecture, and a thousand different things. We had a faithful reproduction of Bible descriptions in the manners and costumes of the road, the hill, the valley and the plain, while the Arabian Nights were faithfully pictured in the cities and towns, thus showing even in Oriental countries the overruling conservatism of country and town. In Jerusalem we took up our quarters at the Mediterranean Hotel, kept by a German named Hungstein, and situated on the famous hill of Zion just near

the Jaffa Gate. It is a large straggling place built partly in the Oriental and partly in the European manner. Tolerably clean and comfortable. Landlord very civil and obliging. We had a cool room with a small balcony, and the heat made it necessary always to sleep with the window open. The table was very good, everything being prepared in a way to suit a Parsee (?) palate, being a mixture of French and Oriental cookery. We had tea or coffee, bread, butter, honey and eggs, from between 7 and 10 a.m. Breakfast at 12, and dinner at 8 p.m., exactly the hours of meal we are accustomed to in Bombay. Though not residing in the hotel, we had at meals with us a German, a Spaniard, and three Syrians. The two former were Consuls respectively for France and Prussia, and the three latter were Government telegraph clerks. They all spoke French among themselves, it serving as a common language to all. None of them spoke English, and the only communication we had with them was just bowing to each other at meal time. It is a matter of sore trial when travelling in a foreign country not to understand or be understood by the natives. And I think it is quite necessary for a man who has extensive travels in view to acquire a knowledge of Arabic and French, besides English. The former is spoken throughout all Arabia and Egypt, Palestine, Turkey in Europe, Asia, and the Islands of the Levant, while the French is understood in almost all countries of Europe.

Left Bahr-el-evady early on the 21st [of May]; lunched near a fine spring of water, cold as ice, and revivifying as the waters of Zem-Zem. Stopped beneath a fig-tree, green and umbrageous, an old woman watching the peach, the apricot, the apple and the vine, which owing to the abundance of water near had just then put forth a profusion of green lovely fruit. . . .

We rested there near four hours, during all which time there was a regular procession, camels, donkeys and horses, loaded and unloaded, visiting the spring, and going down into it with their drivers, both eagerly laving up the cool, delicious liquid, the like of which they very probably had at long intervals. The old woman had a couple of bright-eyed, intelligent, sturdy little

children, who looked after travellers, watered their horses, ran on little errands, and continually dinned Baksheesh! in our ears. We gave the remains of our lunch and a couple of francs to the old woman and some small coins to the children, and the former most heartily thanked us and pronounced a blessing on our undertaking. Our dragoman said she never got such a present as we gave her from any former traveller. Though it was a very nice, cool and shady spot, my friend had his usual grumble; and the dragoman remarked we ought to be very thankful if we got no worse resting place than this on the remainder of our journey. We started from here at 3 p.m., the son of the hotel-keeper (? Hungstein) at Jerusalem having come so far (about 8 miles) to escort us safe past the opposition shop—our dragoman having sent word the previous evening that we were coming. Within about a mile of the city we stopped to have our first look at Jerusalem. Shorn of all Bible impressions and maudlin tearfulness of Murray, it was a beautiful view. It was just about sunset (*vide* Murray and McLeod). It would have been much finer if the sun had been setting behind Jerusalem instead of behind us. The Russian Convent and their hospices were more conspicuous, they occupying a fine and higher site on the west of the city. This is also the West End of Jerusalem; the rich Jew and Armenian merchants and church magnates having their country houses here, surrounded by fine gardens containing all kinds of fruit trees.

We reached Jerusalem at 6 p.m. on the 21st. After a wash we went out for a stroll through the Via Dolorosa and David and Christian Streets. All over the former the localities were pointed out where Christ had rested and fallen down with the Cross, and a stone set in a wall was also pointed out where in falling the elbow of Christ had made a hole about an inch deep and about three in diameter. The hole bore distinct marks of chiselling, but that is of course to be accounted for by the fact that it was not an ordinary elbow that did it, and it is a mystery which God in his wisdom has not thought proper to explain. It may be said that such things as these are got up by the priests only to delude the ignorant, but the learned and truly pious

do not believe in such absurd relics. But truly, it is a mere matter of degree of belief between the learned and the ignorant Christian. The former does not very often go the same length as the latter, but where reason fails them, they use the same means of escaping from a dilemma. In arguing with a heathen, as a truly Christian man always longs to do, when forced into a corner by the absurdity of an opinion, they take refuge behind either a mystery which God in his wisdom has not thought proper as yet to explain to his children, or a demand for faith in the opponent which he has not yet succeeded in bringing about. These are such clear cases of begging the question that it must either be sheer stupidity, besotted partisan zeal, or flagrant hypocrisy that can make a man oblivious to the common decencies of clear, straightforward arguments. When arguing against the religious beliefs of a man why should you beg of him to have faith in all your absurdities while denying him the same privilege in regard to his own? Jerusalem is so full of startling places where miraculous events are alleged to have taken place between two and four thousand years before this, that in going to all or part of them a man is feign to cry out: Can it be possible that nations and men claiming supremacy and possessing it over all the rest of the world, can be either such besotted fools or damned hypocrites as to say they believed all or even a part of the absurdities that are vended in Jerusalem to the pious believer? We had at different times cicerones of two different faiths. A Christian when going over the places of Mohammedan belief, and sometimes a follower of the Prophet when going near places of Christian belief. And though the latter have a certain extent of faith in the alleged messages brought by Moses and Christ, yet they stop at certain lengths and go not beyond certain beliefs, and so it was interesting to note the covert sneer and incredulous tone with which the virtues and miracles of a place of Mohammedan belief were interpreted by a Christian guide, and vice versa. The first *holy* place we visited (22nd) was the Church of the Sepulchre, or the place where Christ was said to be crucified and buried, and where he rose from the tomb. It is undoubtedly the site of Mount Calvary

where he was crucified, and for the rest there appears no authentic record to prove. The place by itself has no attraction on its own account. It is a conglomeration of old and new architecture. It was first built by Helena, the mother of Constantine the Great, the first Christian Emperor of Rome. There are some portions of this ancient edifice still left which are regarded as really antique. The exact spots where Christ was prepared for the Cross, where the latter stood, where Mary stood, where taken and prepared for burial, the grave, the place where the Angel sat, are minutely pointed out and excite the veneration of millions. All different sects, the Latins, the Greeks, the Armenians, and the Egyptians, have their separate chapels in the buildings. But the Greeks were the first in possession, and they have the best and most of everything: the place where the Cross stood belongs to them, and the Altar there is profusely ornamented with precious metals and jewels and hung with tawdry and, in some instances, dirty looking lamps. There is some fine [? fresco] work and paintings. The alleged place of sepulchre is exactly beneath the large dome of the church and covered by a marble cenotaph. All sects have free access to this, but on the tombstone there are two altars, one belonging to the Latins and one to the Greeks. All sorts of holy relics are shown here. The rock that was rent asunder when Jesus cried; the crown of thorns and other things of the same description. But a very valuable and probably the only genuine relic we saw was the sword of Godfrey de Bouillon, the first Christian King of Jerusalem. He was a Knight Templar, an absurdity still kept up by a few. They say Lord Bute, the present Marquess, was made a Knight by this sword, and they offered me the same honour (believing me to be a Christian) for £100, but I declined it with thanks. We could see the Pool of Ezekia from the back windows of our hotel, and this is one of the principal sources of water supply to the town. The same afternoon we went to the Greek Convent and Patriarch's house, but nothing worth notice except that the monks were all very sleek and fat, probably owing to the holy state of beatitude brought about by midnight vigils and fasts; but our guide said it was the air of

Mount Zion. We also visited the British Consulate on our way, and the Consul not being in office we were very civilly received by his Assistant. We wrote our names in a book kept as a register of English visitors. I sought for any Parsee names there, but though I began from 1865, I could not find a single one. (What about Mr and Mrs Cama's visit in 1869 or 1870? Our repeated inquiries failed in getting any information about them.) A very strange thing struck me in the streets. I have noted that the Jews are about the only people in Bombay whose females go out veiled in the public streets, but in Jerusalem it is quite the contrary. The Christians and Mohammedans are veiled, while the Jews go about with unveiled faces. But I was able to account for this by reading in Murray that all the Jews without exception in Jerusalem were from European countries: mostly from Spain, Austria, and Russia, and they brought their European habits with them, while the Christians, being native of the place and having resided long among and under Mohammedans, were at first, as it were, compelled to have veils, and kept them even now, as a matter of custom. I forgot to note that our pincipal object in visiting the British Consulate was to get a *firman* through the Consul to visit the site of the ancient Jewish temple, or the Haram Area, as it is now called. Some years ago none but Mohammedans could visit the place, but since then the liberal Turkish Government has now relaxed its prohibition, and an entrance is allowed to all foreign visitors, on the representation of their respective Consuls, on payment of a fee, which formerly was £5 per man, but has now been reduced to 5s. Sometimes visitors are insulted by fanatics who generally lounge about a Mosque, and the Consul's assistant, to protect us from anything of this kind, promised to [send] the Consulate's Cavass, or troops with us, which he punctually did at 3 p.m.

The Haram, as it is at present called, is the most sacred spot in Jerusalem in the eyes of the Christians, the Mohammedans, and the Jews, more especially the two latter religionists. Up till within the last fifteen or twenty years, as I have already mentioned, any person not a Mohammedan was never allowed to enter

its holy presence. Some English travellers, fired more by curiosity than religious zeal, after large bribes and at immense risk, frequently entered it under disguise. When the influence of European ideas and opinions, and more especially the presence of the ambassadors of the Christian, began to be felt by the Turks, the rules were gradually relaxed, and by orders from the Turkish authorities, through their several Consuls, men of all nationalities and religions were allowed entrance into the sacred precincts. But to propitiate the religious fanaticism of the priests, formerly a heavy amount, now reduced to 5s. per head, was charged, which nominally went to the income of the place, but really into the pockets of the [ ] of the Haram, as the priest or Moulla is called. This title is hereditary, and it is alleged has been in one family since [ ] centuries. I must mention, when speaking of the free access to the Mosque now allowed to all, that there is a strict prohibition in regard to the Jews, and the Consuls are understood, when demanding a *firman* or pass, that no Jew is to take advantage of it. A single Jew is allowed entrance to light a lamp in what is called the Dome of the Rock, the most sacred place in the whole area. And even then he is not allowed, nor does he himself wish, to tread upon the sacred spot, even with his bare feet. Two men carry him in and out of the Mosque without letting him once touch the ground. Owing to their frequent rebellions and obstinate fights when once in possession of the place, the Romans had banished them altogether, not only from the city but from the environs, and the Turks, too, thought it advisable, on political in addition to religious grounds, to prohibit or, at all events, not to encourage their residence in the city. The only approach to anything like a concession to their feelings is the liberty to gather every Friday evening near a portion of the exterior wall of the Haram, but that portion is a really genuine part of the old walls. Here they congregate every Friday evening to weep over and deplore the loss of their country, city, and Temple. We intend going to see this tomorrow, and will describe in due course.

Besides that, the Mohammedan priest who accompanied us asked us to take off our shoes. We had taken

the precaution to carry our slippers with us, and putting them on instead of the shoes, we proceeded into the interior under the priest's guidance. The Sacred Spot, or the Holy of Holies, is a piece of rock between 15 and 20 feet in diameter and sloping on one side. Among the antiquities we were shown the shield of [ ] made of iron or some other heavy metal. Then we were shown the place where, on the conquest of Jerusalem, the Crusaders nailed the Cross. The Cross had been removed, but the nails remained on the stone. The latter must be some 10 or 12 inches thick, and it was said the nails were making their way through it imperceptibly, and when they had all passed through the Day of Judgement would arrive. I don't think any of them had progressed on their journey through more than a quarter of an inch, and I thanked God that the Last Day would not interfere with any of my calculations. The Mosque originally was covered on the outside by what are called china-porcelain tiles, manufactured in Damascus, but time had played havoc with them and they were repairing its ravages with common stucco. The other notable place in the Haram Area is the Mosque-el-Aksa, converted like the Dome of the Rock from a Christian into a Mohammedan place of worship. There is nothing extraordinary about it except the remains of some old mosque, some fine granite columns, and a curious old pulpit made of cedar inlaid with ivory and mother of pearl. They say this was constructed for Omar the Caliph by workmen from Damascus. Going along the wall we entered into what are called Solomon's stables, and in passing into them were shown in a corner a hollowed piece of stone called the Cradle of Jesus, but no satisfactory reason was given as to how it came to be so called. Going further along the walls we were shown a column of granite projecting horizontally from the wall some 3 or 4 feet. It was exactly over against Mount Olivet, and overhanging the Valley of Jehoshaphat. It was said that on the Judgement Day Mohammed would come and take his seat astride on the projecting part of the column, while the resurrected will muster on Mount Olivet and in the valley below. A bridge finer than a human hair, and keener and

sharper than the edge of a Damascus blade, will be stretched across from the column to the highest elevation of Olivet. That all the children of Adam will be in turn compelled to go over the bridge. All the faithful will walk triumphantly to Mohammed and Paradise, while the unbeliever will tumble down through the valley of Jehoshaphat to Hell, which will [ ]. One thing that very forcibly struck me was the appearance when passing through the most sacred places of the priest and his attendant. We did not perceive the slightest signs of [? reverence] in any of them. But we must remember the old adage 'familiarity breeds contempt'. Surely it could not have been the latter, or they would not have shown it before strangers; but it must be indifference. I suppose they put on a sanctimonious look before the pilgrims, as anything like indifference before them would tend to shake the faith of Islam in the holiness of these places, and indirectly touch their pockets. I think it advisable, too, that the wise men among the Jews should check any ambition on the part of their community to gain an entrance into the sacred place; or it may lead from the tears and prayers of desired possession to the indifference and perhaps ridicule of everyday familiarity.

The next day, Friday the 24th, we went out for a walk round the outskirts of Jerusalem. We took the Jaffa Gate, and passing through a modern cemetery saw the Upper Pool of Gihon, which used to supply the Pool of Hezekiah within the walls, and even now it does so, as well as supply the Citadel. From thence we followed the wanderings of the Valley of Hermon, passing the remains of the ancient aqueduct built by Solomon to supply the town with water. The valley dips from the town probably some 300 or 400 feet, and the slopes were brown and bare, with here and there an old olive tree. The sun getting too powerful, we mounted the opposite slope to the ancient rock tombs, the alleged site of Aceldama, or the Field of Blood, where that scapegoat Judas is stated to have hanged himself. We seated ourselves for shelter within the shade of an overhanging rock pierced along its whole face with cavities, which must at some time have been tenanted

by the dead. Passing further on, we saw the Well of Jacob, the Pool of Siloam, where Christ is alleged to have performed the miracle of restoring a blind man's sight. Near to this is a verdant spot shining in soft ease with rippling fountains conveyed for watering the numerous fruit-trees blossoming a . . . We are now in the Valley of Kedron with the walls of the [ ] frowning in the distance; we pass on to the Pool of the Virgin, a deep hole reached by over a dozen broken steps, where half a dozen Jewish women and girls were bathing, making the cavern ring with their merry laughter, and splashing and sporting like so many nymphs. The entrance was guarded by a posse of miserable, dirty-looking Jews who waited their turn to scrub off the dirt of some months probably. These Jews are quite a different lot from the fine, sturdy-looking fellows we are accustomed to see in India. These people were waiting for the general [. . .] the walls, to which we immediately bent our steps up the steep incline of Aphil. Children, young men and women, more old ones of both sexes, all probably numbering some 500 or so, were crowded in a narrow lane enclosed between the exterior of the Haram walls and some enclosure opposite. As many as could find room were standing near the big stones of the walls just over the foundation. They were alternately reading, praying and weeping, and kissing the huge rough stones. (Refer to Murray for a description.)

3rd June, Tuesday.—We struck our tents and started at 7 a.m. But before that we were visited by the nuns (one of them very pretty indeed), asking some baksheesh in aid of a charity school for girls they had established in the town; they were Syrians and said they came from Zara. We commended their object and gave a sovereign, on which they thanked us and said they were going to hold a service on our special behalf. We returned thanks in turn. Some bigots would have refused aid to an institution established with the avowed object of spreading Christianity, but we took a more cosmopolitan view, and thought education and the spread of knowledge under any colouring better than ignorance. We were as usual escorted out of the town by a troop of children, among whom we liberally distributed bak-

sheesh. For about a couple of miles we hugged the beach; after that we struck a bridle-path on the right after crossing the R. Leontes, or as it is now called, Nehr-el-Rasur, over a bridge of stone. Thence our road lay through luxuriant [ ], and latterly through a most romantic glen, very narrow in some places and opening out a score of yards now and again. A small rivulet ran through the centre, being completely arched over with vegetation, among which I discerned the rare golden fern. The wider places were planted with luxuriant gardens of oranges and lemons, pomegranates and figs, etc. The road was narrow in some places, but good on the whole. Arrived on the top of the ridge, there were fields of corn and grain, and extensive fig orchards. On our way we captured two of those curious animals called ichneumons. One we got in a ploughed field was dark-brown colour, another in the grass was green spotted with dirty brown. We are keeping them to note the changes of colour they are sure to display. Our lunching place was in a field beneath a large fig-tree adjoining the village of Zarayene. As soon as we were perceived by the villagers to go and rest beneath the tree, the whole population, male and female, young and old, turned out. The women and children kept at a respectful distance, but the men came and formed a circle round our carpet. The women, satisfied with the distant view they had of us, returned to the village, but the children joined the men's circle and gazed at us while at lunch to their immense satisfaction. When we were on our way we had to pass the village, and the remainder of the villagers turned out and lined the road. There were some very pretty young women among them. No veils. And also four boys, two on donkeys and two on very good mares, accompanied us for about two miles, serving as a guard of honour. The road was rather rough for a mile or two, but it gradually improved as we passed through real valleys waving with wheat, interspersed with fruit orchards. There were also fields sown with grain and tobacco, very young, which depended for moisture solely on the heavy dews of night. We reached our camping place, Nubataya, at 6.30. It is a pretty, romantic-looking place, having

plenty of trees among the houses. The people were busy gathering the harvest and threshing the corn. On our way to this place we saw a curious Arab custom. The reapers in a field of wheat no sooner saw us approaching than two men between them made up a large sheaf of wheat, and having repeated a form of prayer, as if they were singing a duet, presented the sheaf to me. The dragoman said I was expected to give them a small present of money, which I did (1 piastre). A decent way of begging, by the way. The females of Nubataya were the most prettily dressed of any we had as yet seen in the country. Of course the higher classes may be better dressed in places we had been in, but I refer to the bulk of the people. They wore wide pyjamas of coloured cloth, with a sort of bodice and petticoat combined of pretty chintz over it, and a lot of fine muslin over the head. They also wore a sort of veil, but it only covered the underlip and chin. It was wonderful to remark the different ways obtaining in different parts of Syria of covering the head. Some had a piece of muslin, mostly white, covering the face from below the bridge of the nose and another reaching from the head to the brows. In Jerusalem they quite covered the face with fine white or coloured muslin, while the women of Bethlehem, Nazareth, and other places had no pretensions to veils, and these were the best-looking females we saw in the country. About this part of the country, as mentioned above, they have a coloured piece of cloth covering only the chin. Among the population Mohammedans preponderate. We were encamped near a well where all the people in the town came to draw water. About sunset we were surprised to see three young and handsome girls, dressed wholly in white and without veils, leave their water-jars at the well and come up to our tent. On inquiring their business, one young girl stepped forward and said in tolerably good English that she and her mistress, Miss Gibbons, had arrived that day from Tyre and were going the next day to Hubaya, where Miss Gibbons had a school for young girls, and her mistress seeing the English flag, had sent her to inquire as to what people we were. We replied to the inquiries of the little maid that we were

British subjects and from India. I would have very much wished to have gone and seen her, but I was so tired that I did not feel inclined to leave my tent and the savoury smell that arose from Mohammed's sanctum. By the bye, that cook had a surprise for us nearly every day; he made such nice and savoury dishes as we had seldom tasted even at good hotels on our way, and as for the cook of the Deccan, he deserved to be roasted on his own spit, he was so fat and sleek and sent us in such miserable leathery stuff, that if we had been on shore we might have been tempted to say that it was some old superannuated buffalo that appeared on our table. I also forgot to note a circumstance that happened to us on leaving the village of Zarayene after lunch. A burly-looking Mohammedan with a long percussion gun, in tolerable condition, accompanied us from the village, with, as it afterwards appeared, ulterior views on our purses; not that he wanted to rob us, but with some frightful stories about robbers and robberies committed in the neighbourhood he wanted to accompany us as guard, of course for a consideration. He said he was by no means strong enough to fight them, as they were a dozen strong, but as he was intimate with their chief, they would not molest anybody in his company. My dragoman told me what the man said, saying at the same time that there was not the slightest fear about robbers in this part of the country. I told him to reply to the man that we were aware of the dangerous character of the road, and if we had been in the slightest degree afraid of robbers we would have brought guards from the Governor of Acre. But we were so well fortified against the visits of dangerous persons, that we did not dream of having even a single armed man with us. I said the [? baggage] was chock-full of powder, bullets and bombs; in fact it was an infernal machine which at a single spark would explode and destroy a whole country-side, mountains and all. The man laughed and turned back from what proved to be a bootless errand.

4*th June*, 1873. *Wednesday*.—We left Nubataya at 7 a.m., our usual starting time, and through the small town, which did not look so pretty on a nearer approach, we began to mount the everlasting hills again, and

soon entered a deep gorge enclosed between a high and steep hill crowned just on the top with the ruins of an old and most romantic-looking castle on one side, and a fine sloping hill waving with ripe corn and clusters of dwarf oaks and other bushes, and indented deeply with gorges running into the main one. The road wound round and round, now making us swelter under the heat of the sun that radiated from the rocks, and again, as the valley opened towards the north-west, chilling us with the cool breeze from the mountains. We wound through this valley for about half an hour, until after a gentle climb, the deep gorge, through which the Leontes passes, opened before us. We had to go down about a thousand feet in less than half a mile. Some care seems to have been bestowed on this road, as where, nearly impracticable, steps have been cut in the rock and in soil to prevent it washing away during the rains: they are made with huge stones. It is more safe and comfortable to keep on horseback, as the animal preserves its footing with admirable poise, choosing a footing from stone to stone with deliberation and judgement. We crossed the river, which is a rivulet in this season, over a substantial stone bridge. The road up the other bank was much worse, or rather it was no road at all—the horses having to scramble up a steep incline over smooth rounded stones, slipping at every stride but never once coming down. The occupant of the [?] J. R.[1] who had come down, swore loud and deep and called people hard names who at enormous cost came to such places to find enjoyment. The shafts were all aimed at me, though apparently directed towards the dragoman. But silence is golden in such circumstances. He felt when going over such roads in mortal peril of his life, and when the mules stumbled and rattled over the stones and the muleteers cursed and swore at them, he clutched at the side and bawled loudly to be let out. As this was no easy matter, for two men besides the muleteers were required to help him out, there were curses in deep guttural Arabic and J. R. became as great a curse to everybody as it had become to me. He had an idea that all had conspired just to annoy him, to leave all regular

[1] Mr Tata alludes to the palanquin as the J. R. [? Jinricksha.]

high roads and take him over break-neck paths and bye-roads, and it often excited my laughter to hear him adjuring the dragoman in Broach (?) abuse and China pidgin-English with ' But Bet—er— you what for no go tuloo (?) road? what for come this go up and down road?' and he would scarcely believe him when he said there was no other road. But then the abuse would be divided between him and the Turkish Government, which did not provide good roads for travelling old ladies. Soon after crossing the river we ascended for a few hundred yards, and as we reached the rounded top of a hill a splendid view opened out before us. A wide valley, or more properly an extensive basin, opened out before us. It was surrounded on all sides by hills rising a few hundred feet, and extended in length from where we were to a broad expanse of water at the farther end, called Merom, for about 15 miles. In breadth it looked about 6 or 7 miles. It was all cultivated and bore wheat ready for harvesting, grain and other seeds. A multitude of streams flowed into it from our left or the side of Mount Hermon. And as we gradually ascended towards Banias, the hills became greener and covered with thick forest. The whole place was musical with fountains, in fact we met with one every 100 yards. The principal one is the great fount of the River Jordan and rises from beneath a rock in the ruined fortifications of Banias or old Caesarea Philippi. Our camping ground was lovely: every terrace looking on a wide expanse of [ ] on one side and on the other overtopped by the Castle of Subeibeh, which hung over us from a height of at least 700 feet. We had journeyed from Jerusalem without any rest except the half-day we had at Nabulus, and I was thoroughly tired and knocked up, and in sore need of a day's rest. But our friend, after being on horse-back only for nine hours, stood in need of rest of two or three days, quite forgot the circumstances, which being carried in the J. R. cushion with two rugs and pillows, and notwithstanding all his curses against the roads, he travelled ten hours a day to get out as quick as possible out of this cursed place and reach Damascus, that haven of rest and paradise on earth, as a look into Murray satisfied him it was. Working on this plan and

seeing that his grumblings induced everyone to look sharp after him, refused to stop in Banias, notwithstanding my serious [ ] that I was too much tired to move with ease. But no, he would go on affecting to believe that my plea of fatigue was a mere excuse to loiter on the road. I could never have believed in Bombay that such selfishness was a part of his nature, but it is strange to note how the deprivation of a few comforts makes of a really honourable gentleman a selfish, egotistical, complaining mortal. I had to forget long fatigue and weariness and told the dragoman with indignant feelings to move early the next morning. He was inclined to complain on account of the animals, but I shut him up and said the march of eighteen hours or so to Damascus *must* be made in two days. He grumbled, but submitted.

5*th June, Thursday*.—We started about 7 a.m. and passed the village of Banias, which has been formed within the old ruins of Caesarea Philippi. The old bazaar built in arches of massive stone stood entire but buried in a heap of [ ], the old gateway, too, patched in different places, and with an Arabic inscription over the arch stood, but threatening to come down every moment. The people, with Nature's bounties in abundance about them, looked a wretched lot, emaciated and begrimed with dirt, the females, even the young ones, looking like ugly hags. But the beauty of one we saw in the house of the Sheikh as we passed made up for the ugliness of the whole lot of them. Two young women came on to the roof of the house to see our cavalcade pass; one was a little over twenty, the other probably seventeen. Both were good-looking, but the latter was surprisingly lovely. As I passed close I made a low salaam; the elder one returned it gracefully, but the younger, like a school-girl, taking the end of her veil in her mouth, only tittered and laughed. It would repay the trouble of a visit to Palestine just to obtain such a look as that. Our friend in the J. R. being in one of his unamiable moods, sat fortified behind his purdahs and lost the pleasure of a sight that would have made him relent into a smile of pleased admiration. We mounted up for about two hours until the Castle of Subeibeh and

that at Banias, towering over our heads, now lay beneath our feet, and a grand panorama of the extensive valley that we passed yesterday lay opened before us. It lay in large rectangular patches of golden yellow, vivid and dark green and dark brown being the colours of the ripened wheat, the young crops of onions and gram and of ploughed fields. The day was a cool and cloudy one, and as the light and shadow played over this splendid plain and the hills in which it was set, the colours on the latter kept changing, chameleon-like, from dark to vivid and from vivid to dark. In three hours we passed the village of [ ]. The cold wind made us shiver and wrap our Abayas closely round us. Shortly after passing the above village, from a ridge which could not be less than 6,000 feet above the level of the sea and being the southern range of Mount Hermon, we obtained a view of Damascus. It must be nearly 25 miles and looks like a line of white surf breaking over low rocks within an intensely blue lake. The plain in the midst of which Damascus is situated is a sea of green verdure, but the distance and the mist on the horizon makes it look of a deep purple colour, and from between the foliage, only the tall buildings and domes and minarets of mosques are seen from this elevated spot. We travelled four hours and stopped for lunch in a beautifully green and fragrant meadow just at the base of Hermon. It was very cold, though noon, and everybody despising the shade, went from under some magnificent trees and sat in the chequered sunshine. We reached our resting-place nearly at 7 p.m., thus being nearly nine hours in the saddle today. The place from a distance looked bleak and desolate, but on nearer approach we found our tents pitched under some walnut trees in a lovely dell all one tangled mass of foliage. Mulberry, fig, walnut, pomegranate, apricot and peach all in inextricable confusion. We were on a ledge with a small rivulet gurgling at our feet, but the valley dipped into the hollow far beneath us with Hermon towering at our back in the distance. Our hosts were fine Mohammedan people and were very attentive, and probably the idea of baksheesh to come in the morning. I was ravenously hungry, but our friend having been lolling in the J. R.

all the five hours, did not feel its pangs so keenly, and had generally to take a refresher to enliven his appetite. Even then it was never before 8 p.m., and very frequently past that, that the fiat went forth to Mirwan to get dinner on the table. I very frequently went to sleep before it was called, being generally awfully tired by the time it came. Just fancy the feelings of a man coming tired from a ride of 15 or 18 miles and having to wait for his dinner one hour and sometimes more, and knowing all the while that the dinner, far from being not cooked, was waiting on his appetite. I generally took tea immediately after coming in, partly to allay thirst, partly to kill fatigue, but mostly to stay those pangs which were devouring me. I could easily get bread and butter, but having tried it one day, lost all appetite for the recherché dinner that Mohammed as usual served up. Following me, the friend also took a cup and sometimes two of the refreshing beverage, but the refreshment served to keep me on the tenter-hooks for another half-hour. As we approached Damascus, we did not perceive the signs of such a large and populous city. Our road for nearly two hours before reaching the gate lay through extensive plantations of vines, planted on the open fields without hedge or ditch to protect them. The grapes were borne in abundance, but as yet small and green. For nearly three miles before we reached an encampment of soldiers we did not see a single animal or human being, even a bird was not . . .[1]

[1] A few words are illegible, but one or two conjectural words have been inserted.—F. R. H.

APPENDIX B

(This phrenological delineation of Mr Tata, made in London in 1885, was considered by his family and friends to be very accurate.)

YOUR organization denotes a quick and active mind, constantly employed thinking. Many of your ideas may be in advance of your time, and not quite understood by others.

You have naturally a large amount of natural penetration and knowledge of character. You will, owing to this natural penetration or intuition of the minds of people, be a little suspicious and doubtful of both actions and motives. You have the ability to see beneath varnish and polish, faults, failings, and flaws.

This knowledge of character would be of benefit if you engaged in a pursuit requiring you to address yourself to individuals at the first sight. It would enable you to form conclusions concerning them, which in nine cases out of ten would be correct.

You have a good planning organization; like to see the end from the beginning when possible, and to count the cost before commencing to build. You like to do things with carefulness and stability. You are able to put your plans into execution, and though they may appear difficult to your friends, they will seem easy and plain to you. With all the important plans of life there will be a steady decided aim. You can form a number of them, and after weighing the one against the other, choose with clearness and decision the good from the bad or indifferent.

Your opposing faculties will give you the ability to overcome obstacles and to assail opposition. You have a good amount of determination and force of character. You do not believe in failure, but will try again: more especially if you meet with difficulties. You are generally more inclined to bend circumstances to your profit than to allow them to control you.

You possess a formation of mind giving ability to take the lead in large undertakings, where organization, guiding and controlling power would be required.

It will be to your advantage to carry out your plans and transactions upon your own responsibility as much as possible, rather than in partnership with others: except you would have good reason for doing so. As long as you are in a position to follow out the guidance of your own intelligence, you will seldom fail in your undertakings.

Your actions, so far as the right and wrong is concerned, will be very much under the guidance of reason even more than conscience, for your conscience will be led by your reason; therefore your actions at times may be opposed to the consciences of others, and they might condemn you for what you would consider thoroughly right and correct.

The faculty of 'acquisitiveness' is so developed that it causes you to wish to be possessed of money, etc., for the purpose of being independent, but at times you are hardly miserly enough, and in benefiting your friends you may often injure yourself. This should be guarded against.

The faculty of 'cautiousness' is well developed; while it will be a protection to you, preventing you from willingly going into danger, it will, on the other hand, often be a drawback, preventing you from undertaking many responsibilities which you could carry out with success. In this manner good opportunities will often be missed.

This faculty will also cause you to look to the doubtful side, thinking more of failure than success. If you encourage these feelings, when they come without sufficient cause, they will be injurious, and should be guarded against. Keep the faculty of 'hope' in activity, so that it will counteract the effect of 'cautiousness'. This you can do by encouraging hopeful, cheerful thoughts and anticipations for the future; by doing so you will benefit yourself both mentally and physically, and will carry out your plans better.

It would be better if you possessed more concentration of thought. Your ideas often come into your mind too quickly, and thus your plans may interfere with each other. Once you decide to carry out a plan, it will be advisable to concentrate the mind upon it till completed,

and not to allow the mind to be divided. In cultivating the concentrating ability you add to the strength of your talents and faculties generally.

You are often inclined to make 'firmness' do the duty of 'concentrativeness', but to do this would be injurious in many ways. Each faculty should be brought into activity to act for itself, and thus the mind would be better balanced.

Your reflective or reasoning faculties are largely developed. Reason with you is natural and intuitive: the cause, investigating and seeking faculty of 'causality', will take a leading part in all the deliberations of your mind. The strength of this faculty may cause you to doubt, where others would readily believe, but you will be careful before you either accept or reject a statement. You take a good amount of latitude to think, but you give the same latitude to other people's thoughts which you take for your own; therefore you will not be bigoted.

The faculty of 'comparison' will enrich you with much analysing and criticizing abilities, thus adding to the strength of your reasoning power.

The faculties of 'ideality' and 'sublimity' take a leading position, causing you to appreciate and derive pleasure from the beauties of nature and art.

Your aspiring faculties are such that they will compel you in an onward course. You would prefer stormy weather in preference to stagnation, and are ambitious to excel in your undertakings.

The faculty of 'benevolence' will cause you to feel much sympathy with others; and through it you will gain influence of people.

You possess a strong desire to be honest in your dealings and intercourse with your fellow-men. You will feel much annoyance and indignation towards those who willingly harm, injure, or defraud you or yours. Though you prefer to live on terms of peace with others, and will do a good deal for that purpose, yet you can when required defend yourself, your rights and principles with much courage.

You have a good amount of foresight, principally derived from your calculating powers and ability to

estimate the future from the basis of the past. This will enable you to manifest much judgement in giving advice concerning undertakings either of an ordinary or speculative nature.

While you possess much agreeableness and suavity, you try to avoid flattery, and you will gain the confidence of others by the soundness of your judgement and general reliability of your advice.

Your brain being naturally active, you should avoid a diet calculated to bring it into greater activity. Stimulants should be guarded against, and a quieting diet taken.

You have a good constitution, but care ought to be taken not to bring the brain into such activity as to overtax the bodily strength.

'Language' is well developed, and will give you much facility in speaking conversationally, also in acquiring foreign languages. If you wished to do so, you could cultivate this faculty for public-speaking.

Though the faculty of 'firmness' is large, yet you are not stubborn in your opinions, and can yield with a good grace if you find that you have been in the wrong.

You are sociable, domesticated, and take great pleasure in domestic life. You will derive your truest happiness from social life. You derive much pleasure in seeing your family circle happy, and if necessary would deprive yourself of many gratifications to benefit your family. You are a good provider, like to see plenty without waste. If away from home travelling for any length of time, you would have a desire to return again, and in the end would derive your truest happiness from being settled in your own home. If possessed of a limited income, you would spend the greater portion of it for household purposes, even if you had to deprive yourself for that purpose.

You may have a large circle of acquaintances. Yet it is not many of them you will consider your friends, for this reason, when you give your affection or friendship it will not be lightly withdrawn, and you will be sincere in your friendships.

You would do much for your children, and, if required,

you could suffer for them. But you would wish them to be obedient and kindly disposed towards you; little faults and failings you would readily forgive, either in your children or your friends. You prefer to win obedience by kindness and conciliation rather than by severity.

The faculty of 'self-esteem' is sufficiently large to give you confidence in yourself on all ordinary occasions, yet in the more important transactions of life it would be to your benefit to place more confidence in your talents and abilities.

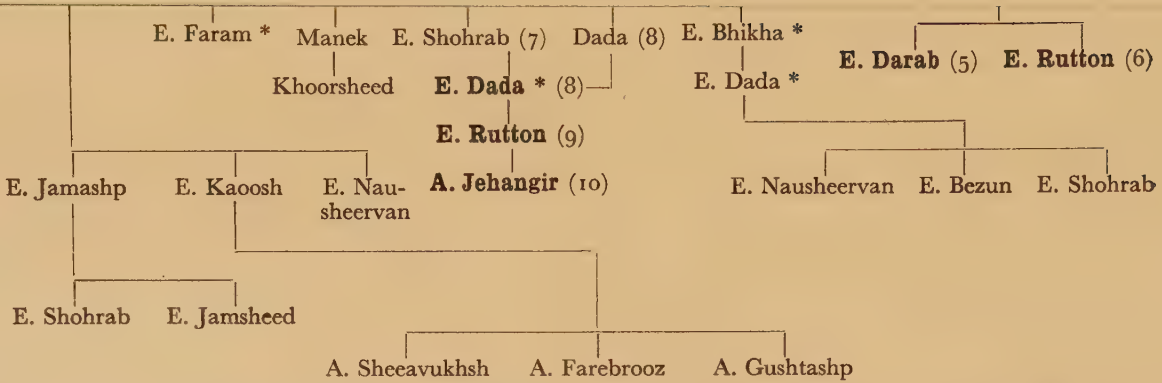
Taking your organization on the whole, it denotes an exceedingly active and impressible mind, which is capable of accomplishing much mental work. You are adapted for pursuits requiring intelligence, activity, and power for organization where you would have a number of others under you to carry out your plans.

The intellectual faculties will be the leading group in your organization, and if made full use of will enable you to accomplish much tending towards your success.

Though you might be successful at other occupations, you have abilities for commercial and mercantile pursuits —especially if upon an extensive scale and upon your own responsibility.

APPENDIX C

Genealogy of the Tata Family



NOTES: (1) Meherji, son of Rana, was adopted by his uncle, Vacha, and was the first High Priest of the Parsees, and founder of the Meherji-Rana family, who are the hereditary High Priests of the Navsari Parsees. Navsari is the premier see, equivalent to the Archbishopric of Canterbury. (2) Nusserwanji Tata's grandfather. (3) Mr Nusserwanji Tata. (4) Mr J. N. Tata. (5) Sir Dorabji Tata. (6) Sir Ratanji Tata. (7) Mr Sorabji Tata. (8) Mr Dadabhai Tata. (9) Mr R. D. Tata. (10) Mr R. D. Tata's son, Jehangir, the present Chairman of the Tata organization. The above names are spelt phonetically in the Persian form, which is employed in all religious ceremonies, such as a recital of the names of one's ancestors, who are invoked, together with the names of the illustrious men of the past. The names Nusserwanji, Jamsetji, Dorabji, Ratanji are Hindu forms with 'ji' as a suffix.

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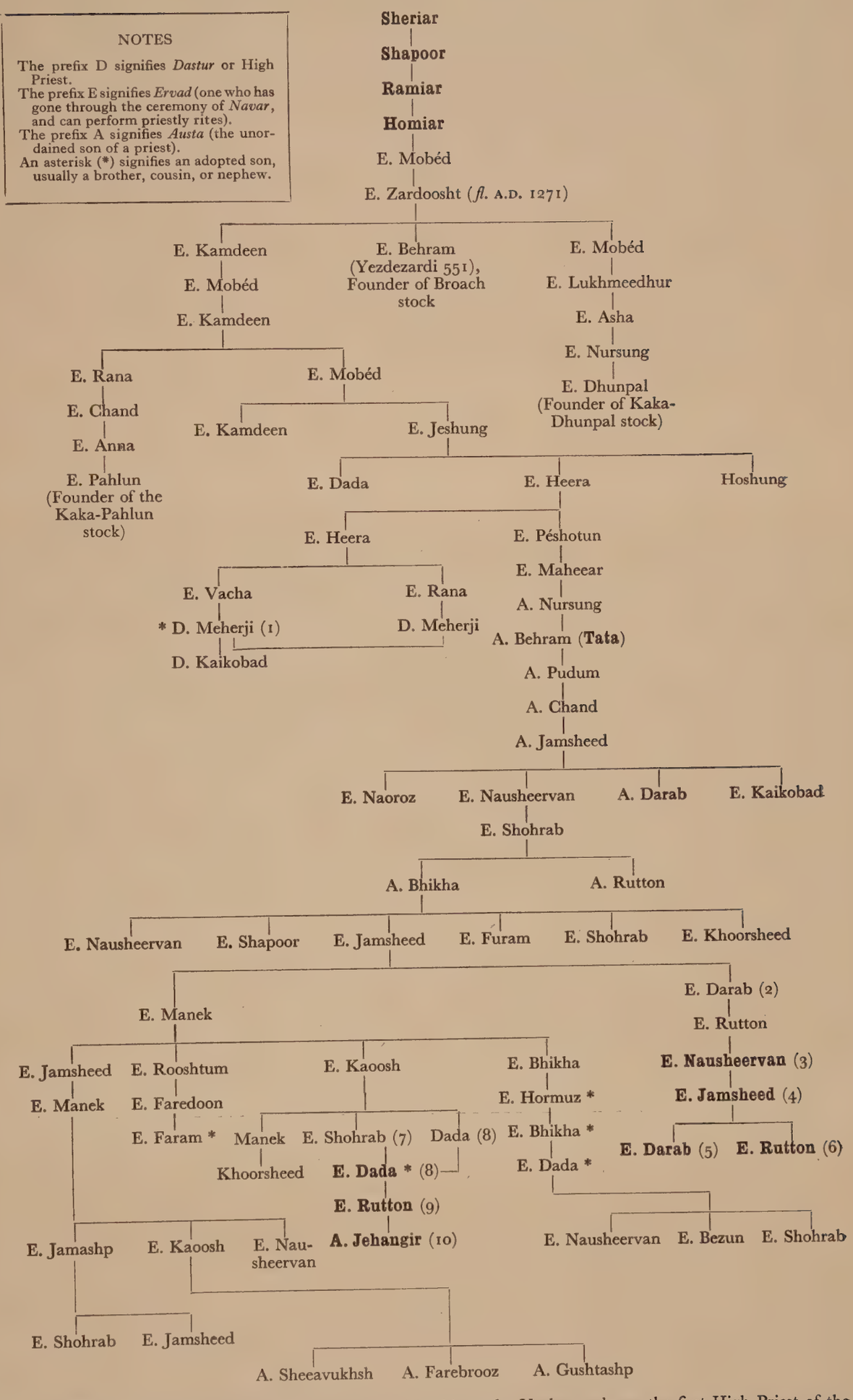
APPENDIX C

GENEALOGY OF THE TATA FAMILY

NOTES

The prefix D signifies *Dastur* or High Priest.
The prefix E signifies *Ervad* (one who has gone through the ceremony of *Navar*, and can perform priestly rites).
The prefix A signifies *Austa* (the unordained son of a priest).
An asterisk (*) signifies an adopted son, usually a brother, cousin, or nephew.



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APPENDIX D

It may be of interest to readers of the second edition of the life of J. N. Tata to learn of later developments in the Tata organization. In the first edition Harris covered not only the life of Jamsetji Tata but the progress of the three major projects that were initiated by Jamsetji and completed by his successors, the Steel Works, the Tata Hydro-electric System and the Indian Institute of Science. Other schemes and ventures followed, and Harris brought the record of Tata enterprises up to 1925, the year in which the first edition was published.

Since the ideas and outlook of the founder have inspired and influenced subsequent developments, it seems appropriate to give readers some information which will reveal the lines on which the Firm expanded. The information is given in the form of short notes on each unit in the organization as in 1957. Together, they will help to give a comprehensive picture of the present structure and range of Tata interests.

Tata Sons Private Limited
and
Tata Industries Private Limited

The private trading firm, established by J. N. Tata in 1868 with a capital of Rs. 21,000, had expanded by 1907 into an industrial house with a capital of Rs. 15,000,000 under the name of Tata Sons and Company consisting of Sir Dorab Tata and Sir Ratan Tata, sons of the founder, and Mr. R. D. Tata, their cousin. It was converted in 1917 into Tata Sons Ltd., with an authorized capital of Rs. 22,500,000.

Tata Sons Ltd. controls at present the largest single aggregation of Indian industry with a total financial

investment of Rs. 2,800,000,000 (£210,000,000 or $588,000,000), including the cost of projects under construction.

Over eighty per cent of the capital of Tata Sons is held by Charity Trusts endowed by members of the Tata family. An overwhelming proportion of the profits of the firm is thus devoted to philanthropic objects and goes back to the people.

To separate the managing agency business from the other activities of the firm, a subsidiary company, Tata Industries Ltd., wholly owned by Tata Sons, was established in April 1945 as a private limited company. Tata Industries with an authorized capital of Rs. 30,000,000 has taken over the managing agency of the companies formerly managed by Tata Sons.

Tata Limited, London

Formed originally for trading purposes in 1907, Tata Limited are the accredited agents and representatives in Europe of the Tata group of companies and other organizations in India, for whom they undertake the purchase of plant, stores, equipment and materials, the sale of products, and the recruitment of technical staff.

Tata Incorporated, New York

Tata Incorporated, established in 1945, are the accredited agents in the U.S.A. of all Tata enterprises and other organizations in India for the purchase of plant, stores and equipment and the engagement of technical staff.

The Tata Iron and Steel Company Limited

The steel industry of India dates back to the formation in 1907 of the Tata Iron and Steel Company Ltd. with a capital of about Rs. 23,000,000 and a productive capacity

TATA LOCOMOTIVE AND ENGINEERING COMPANY—A VIEW OF THE AUTOMOBILE DIVISION

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of 100,000 tons of steel ingots per annum. Fifty years later, the Company's total financial investment, including the cost of projects under construction, exceeded Rs. 1,700,000,000 (£127,500,000 or $357,000,000) and the production of the Steel Works under the Company's current development programme on which Rs. 1,000,000,000 are being spent, will be 2 million ingot tons per annum by the end of 1958.

The little jungle village of Sakchi where the Steel Works were first built has grown into a model industrial town of nearly 300,000, built, developed and administered by the Company. A committee of independent experts reporting on Jamshedpur's municipal services, which are all provided by the Company, recently described Jamshedpur as ' perhaps today the best-served town in the country '.

At its works, mines and collieries the Company, in 1957, provided employment for over 60,000 persons.

The establishment of the steel industry at Jamshedpur has resulted directly in the development of a number of ancillary industries in the area, manufacturing a wide range of products.

Tata Locomotive and Engineering Company Limited

Established in 1945, the Company's total financial investment, including the cost of projects due to be completed by 1958, is about Rs. 330,000,000.

The Company with its works located near the Steel Works at Jamshedpur has three main divisions: a Locomotive Division producing 100 complete locomotives a year; an Automobile Division producing more than 6000 diesel trucks and bus chassis a year; and a Foundry Division with a capacity of 12,000 tons of steel castings per year and 6000 tons of alloy iron castings per year for the requirements of the Company and of the Government-owned locomotive works at Chittaranjan. The Company's turnover in 1957 was over Rs. 210,000,000 (£15,750,000 or $44,100,000).

The Indian Tube Company (1953) Limited

The Indian Tube Company, a joint enterprise of the Tata Iron and Steel Company Ltd. and Stewarts & Lloyds Ltd., the largest makers of steel tubes in Europe, has a subscribed capital of Rs. 40,000,000.

With a Fretz-Moon tube plant and an electric resistance weld tube plant, the Company manufactures a wide range of gas, water and steam pipes and tubes and precision tubes for locomotives, loco-boilers, cycles and electric conduits. A seamless tube plant is being installed for the manufacture of pressure tubes.

The Tata Hydro-electric Power Supply Company Limited (1910)
The Andhra Valley Power Supply Company Limited (1916)
The Tata Power Company Limited (1919)

The Tata electric system, established in 1910, operating as a grid and comprised of the three Companies named above, represents perhaps the only attempt to harness the power potential of seasonal rains, in this case of the Indian monsoon, by impounding the summer rainfall in lakes created in the mountain valleys of the Western Ghats. In addition to the three hydro-electric power stations generating 276,000 kw., the system includes a thermal station near Bombay with a capacity including current expansion of about 190,000 kw. In addition to its own power, the Tata grid distributes power from a Government-owned thermal station of 118,000 kw.

The Tata Oil Mills Company Limited

Established in 1917, the Company with its factories at Tatapuram (Kerala), Sewri (Bombay) and Manicktalla (Calcutta), is a leading Indian manufacturer of washing and toilet soaps and allied products with an annual sales

TATA CHEMICALS FACTORY, MITHAPUR

facing p. 323

turnover which in 1957 amounted to Rs. 66,000,000 (£4,950,000 or $13,860,000).

Lakme Private Ltd., a subsidiary owned by the Tata Oil Mills, was established in 1952 for manufacturing perfumes and cosmetics in India in conjunction with the manufacturers of Piguet and Renoir Products of Paris.

The Central India Spinning, Weaving and Manufacturing Company Limited (1874)
The Svadeshi Mills Company Limited (1886)
The Ahmedabad Advance Mills Limited (1903)
The Tata Mills Limited (1913)

J. N. Tata's first venture into the field of industry was in textile manufacture at Nagpur in 1874. Today the four mills named above constitute the Tata group of textile mills with a labour force of 23,000, operating 7000 looms and 300,000 spindles and manufacturing a wide variety of cotton fabrics. The total annual production of the Group amounted in 1957 to over 160 million yards.

Tata Chemicals Limited

Established in 1939, this Company's Works located at Mithapur in Bombay State convert the brine from the sea into basic heavy chemicals. Supplying a substantial part of India's total requirements of soda ash, caustic soda and other important chemicals the Company serves through its products Indian industry and agriculture. The annual sales turnover in 1957 exceeded Rs. 26,000,000 (£1,950,000 or $5,460,000).

Tata Fison (Private) Limited

Tata Fison (Private) Ltd. was formed in 1957 in association with the well-known British chemical enterprise of

Fisons Pest Control Ltd. for the formulation and distribution of a number of new pest control products.

Voltas Limited

Voltas Ltd. was promoted in 1954 under the joint auspices of Tata Sons Private Ltd. and Volkart Brothers, a Swiss merchant house established in India in 1851. The Company's activities include the import, distribution, erection, design, servicing and part manufacture of equipment and machinery for electrical, mechanical, air-conditioning and refrigeration, agricultural, earthmoving and textile engineering purposes and the import and distribution of fine and heavy chemicals, bulk vitamins, pharmaceutical specialities, antibiotics and typewriters. The Company, with a paid-up capital of Rs. 25,500,000, had in 1957 an annual sales turnover of over Rs. 145,000,000 (£10,880,000 or $30,450,000).

The Investment Corporation of India Limited

The Company, formed in 1937 by Tata Sons Private Ltd., principally for the purpose of affording the shareholders safe and diversified investments covering the leading security markets of the world, and spread over a wide industrial field, has a number of associated and subsidiary concerns, assists in the floating of new concerns by underwriting their capital issues and in other ways to assist in the industrialization of India. It has so far underwritten or otherwise financed enterprises to the extent of over Rs. 70,000,000.

The Corporation has a number of associated and subsidiary concerns including the Investa Industrial Corporation Ltd., Investa Machine Tools and Engineering Co. Ltd., the National Ekco Radio and Engineering Co. Ltd. and the Indian Standard Metal Co. Ltd.

The Indian Hotels Company Limited

Established in 1904, the Company owns and operates the Taj Mahal Hotel, Bombay, one of the leading hotels in the East, and Green's Hotel, Bombay.

The Commercial Printing Press Private Limited

The Press, established in 1862, was taken over by Tata's in 1930. While doing printing work primarily for the various Tata Companies who now jointly own it, the Press also undertakes special quality printing for Government and commercial establishments.

The New India Assurance Company Limited

Formed in 1919 by a group of leading industrialists and business men of Western India headed by Tata's, New India is the largest composite insurance company in India.

The Associated Cement Companies Limited

The largest cement combine in India, the A.C.C. was formed in 1936 by a group of sponsors including Tata's. Its annual production in 1957 was about 3 million tons of cement.

Air-India Limited
and
Air-India International Limited

Air-India and Air-India International, established by Tata's and operated by them for a number of years, were nationalized in 1953 when the Government of India nationalized civil aviation. Air-India Ltd. was formed to

take over the business of India's pioneer airline, Tata Airlines, founded in 1932, to operate passenger and mail services within the country. Air-India International Ltd. was sponsored in 1948 by Tata Sons Private Ltd., Air-India Ltd. and the Government of India to operate international services between India and the countries of the West. Mr. J. R. D. Tata, the first pilot to hold a Commercial ' A ' licence in India and one of the first two pilots to make the India-England flight solo in 1929, continues at Government's request to be the Chairman of Air-India International Corporation.

Philanthropic Activities

The philanthropic activities of the Tata organization have been carried on mainly through the charitable Trusts endowed by members of the Tata family.

J. N. Tata Endowment for Higher Education

The Endowment was founded by J. N. Tata in 1892 to provide opportunities for higher education in Europe and America to Indian students of exceptional merit. Tata scholars include a number of eminent civil servants, doctors, economists, scientists and technologists.

Sir Ratan Tata Charities

This trust was established in 1918 under the will of Sir Ratan Tata for the purpose of education, medical relief, social and industrial welfare, relief of distress due to natural calamities and other objects of general public utility. The Trust made a major contribution to the establishment of the National Metallurgical Laboratory of India.

Sir Dorabji Tata Trust

The Trust was created by Sir Dorabji Tata in 1932 for the benefit of humanity without distinction of place,

nationality or creed, the principal objects being the relief of distress caused by the elements of nature; the advancement of learning in all its branches, especially research work in connection with medical and industrial problems; and support of educational institutions and granting of scholarships.

The following institutions are associated with the Trust.

The Tata Institute of Social Sciences, founded in 1936, offers to graduates of Indian and foreign universities training in social work and social sciences with the object of providing public and industrial organizations with workers trained in professional social work.

The Tata Memorial Hospital, established in 1941, is the first institution in India to specialize in the treatment of cancer and allied diseases. The Trust continues to be associated with the management of the Hospital, which was handed over to the Government of India on 1st April 1957.

The Tata Institute of Fundamental Research, established in June 1945 by the Sir Dorabji Tata Trust in co-operation with the Government of Bombay, and now supported largely by grants from the Goverment of India, is the all-India centre for fundamental research in physics, mathematics and allied sciences, directly and closely associated with the Government of India's Atomic Energy Establishments.

Lady Tata Memorial Trust

Founded in 1932 by Sir Dorabji Tata as a memorial to his wife, Lady Meherbai Tata, the Trust sponsors research in diseases of the blood with special reference to leucaemias by awards open to candidates of all nationalities.

5th November 1957.

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